

## **A Hierarchical Linear Model of Factors Associated with Public Participation Among Residents Living Near the U.S. Army's Chemical Weapons Stockpile Sites**

**Bryan L. Williams, PhD**

EBR Director and Assistant Professor of Epidemiology  
Environment, Behavior, and Risk Research Laboratory (EBR)  
University of Arizona

**Hoi K. Suen, EdD**

Professor of Educational Psychology  
The Pennsylvania State University

**Sylvia Brown, MPH**

Senior Research Specialist  
Environment, Behavior and Risk Research Laboratory  
University of Arizona

**Roberta Bruhn, BS**

Senior Research Specialist  
Environment, Behavior and Risk Research Laboratory  
University of Arizona

**Rich de Blaquiére, BS**

Research Specialist  
Environment, Behavior and Risk Research Laboratory  
University of Arizona

**Sarah E. Rzasa, BS**

Psychometric Consultant  
The Pennsylvania State University

**All correspondence should be directed to:**

Bryan L. Williams, Ph.D.  
University of Arizona  
Arizona Prevention Center (EBR Lab)  
Campus PO Box 245163  
Tucson, AZ 85724  
(520) 626-3406  
bryanw@u.arizona.edu

# Table Of Contents

<b>Executive Summary.....</b>	<b>1</b>
<b>Background .....</b>	<b>2</b>
<b>Literature Review.....</b>	<b>3</b>
Origins Of Contemporary Public Involvement .....	3
Barriers To Involving The Public.....	4
<i>Defining The Public</i> .....	4
<i>Reactive Public Involvement</i> .....	5
<i>Conveying Technical Concepts To The Lay Public</i> .....	6
Effective Public Involvement Programs .....	6
<b>The Chemical Weapons Stockpile Community Study .....</b>	<b>7</b>
<b>Methodology .....</b>	<b>7</b>
Study Region Characteristics .....	7
Instrument Development .....	8
<i>Identification Of Survey Objectives</i> .....	8
<i>Focus Groups</i> .....	9
Quality Assurance/Control Procedures.....	10
Sampling.....	10
<i>Sample Size</i> .....	11
Data Collection .....	11
Research Variables.....	12
<i>Individual Level Variables</i> .....	12
<i>Community Level Variables</i> .....	12
Treatment Of Data.....	14
Analysis Procedure.....	15
<i>Exploratory Analysis Steps</i> .....	15
<i>Generating Subsets Of Data</i> .....	17
<i>Global Data Set</i> .....	17
<i>Risk Perception Data Subset</i> .....	17
<i>Participation Data Subset</i> .....	18
<b>Results.....</b>	<b>18</b>
Response Characteristics .....	18
Sample Characteristics .....	19
Participation In Civic Activities .....	19

Intent To Participate In Chemical Demilitarization Program.....	21
Participation Intent Analysis I: Global Data Set .....	22
<i>Results</i> .....	22
<i>Interpretation</i> .....	23
Participation Intent Analysis II: Risk Perception (ACTY) Data Subset .....	24
<i>Results</i> .....	24
<i>Interpretation</i> .....	25
Civic Participation Analysis III: PART Data Subset.....	26
<i>Results</i> .....	26
<i>Interpretation</i> .....	27
Participation Intent Analysis IV: PART Data Subset .....	27
<i>Results</i> .....	27
<i>Interpretation</i> .....	28
<b>Discussion</b> .....	30
<b>References</b> .....	36
<b>Appendices</b> .....	40

## Executive Summary

The purpose of this study was to describe public involvement among residents living near the U.S. Army's eight chemical weapons stockpile sites. University of Arizona researchers conducted a cross-sectional descriptive and analytical study across ten states. Primary data were obtained through a random digit dialing population survey. Site specific survey teams systematically identified and prioritized objectives for the population survey. The study sample consisted of 8,315 residents living within emergency response zones surrounding the U.S. Army's Chemical weapons stockpile sites. The *refusal rate after consent* was 21% across all sites.

Researchers analyzed *types* of civic participation, the *intent* to participate, and the perceived *level of comfort* with site-related decisions and decision-makers. Three research questions were investigated: (1) To what extent do respondents *participate* in specific civic activities, and to what extent do respondents *intend* to participate in site-related decisions? (2) To what extent do psychological, social, economic, and programmatic factors influence a respondent's *civic participation* or *personal intent* to participate? (2) To what extent is a respondent's *civic participation* or *personal intent* to participate individually or contextually determined? Residents in this sample exhibited moderately high levels of civic participation. Residents reported participating in more civic activities than did respondents in other environmental policy studies. The intent to participate in site-related decisions was also seemingly high among these residents. Overall, residents across the sites did not differ greatly with respect to either civic participation or the intent to participate. Civic participation was primarily associated with educational attainment and family size. The intent to participate was primarily associated with the following individual variables: perceived technological attributes, perceived risk, perceived impact, perceptions toward public outreach, educational attainment, and gender. In terms of community variables, the intent to participate was also associated with a number of activist groups present in the local community.

## Background

Involving the public in technical decision-making poses a formidable challenge to governmental institutions. Although increasingly advocated and mandated, meaningful public participation in environmental policy-making rarely occurs. Often such participation is nominal at best, resulting in decisions that are inherently vulnerable to legal and political challenges. Given the obvious liability of such challenges, federal and state institutions are ever more charged with ensuring that the public plays a central role in the decision-making process. For example, since the end of the Cold War, the U.S. Departments of Defense (DOD) and Energy (DOE) have been charged with involving the public in the management and disposal of their chemical and nuclear stockpiles. Historically, DOD and DOE have responded poorly to this charge (Binney, Mason, Martsolf, and Detweiler, 1996; Flynn, Kasperon, Kunreuther and Slovic, 1997; Shepherd and Bowler, 1997). For example, citizens have accused the Army of leaving “the public in the dark about major program decisions, such as schedule, technology and program design” (Shepherd and Bowler, 1997, p. 6). DOD’s and DOE’s inability and perhaps unwillingness to involve the public is much more complex than it might appear on the surface.

Why have DOD and DOE failed to effectively involve the public in decisions related to weapons management and disposal? Although it is easy to criticize “big government” for ignoring public concerns, it is important to consider that there are substantial barriers to effective public involvement. First, the technical complexity of weapons management and disposal is very difficult to convey in a way that the public can understand and that does not oversimplify the issues (Merkhofer, Conway, and Anderson, 1997). Can the public participate meaningfully in decisions that they do not understand? The answer is unclear. Secondly, it is becoming increasingly apparent that there is a lack of consensus as to exactly *who* the public is and what public *involvement* really means. There is considerable inconsistency in “how and when the public is involved and who is involved in the name of the public” (Perhac, 1998). There is a lack of studies that document *how* citizens *want* to be involved.

Finally, assuming one has identified the so-called public, defining public involvement represents an entirely different matter. Definitions of public involvement vary widely. Some argue that the collective public should be given a great deal of authority to make decisions (i.e., decisions by public referendum) (Carnes, Schweitzer, Peelle, Wolfe, and Munro, 1998). Conversely, others contend that public involvement simply entails “informing” the populace about policy decisions and providing people with opportunities to “participate” in such decisions (Lidskog, 1997). The lack of a clear and stable definition of public involvement makes the practice of public outreach difficult. In its current form, the parameters for effective public involvement are indeterminate.

The purpose of this study was to describe patterns and correlates of public involvement among residents living near the U.S. Army’s Chemical weapons stockpile sites. Specifically, this investigation was designed to identify tangible criteria for public involvement and to describe the public’s participatory tendencies. To this end, researchers

analyzed *types* of civic participation, *intent* to participate, and the perceived *level of comfort* with site-related decisions and decision-makers.

## **Literature Review**

### **Origins of Contemporary Public Involvement**

The impetus for public involvement hardly stems from “governmental philanthropy.” In fact, the institutional cultures of government groups such as the military have historically focused on secrecy not open disclosure. The end of the Cold War, political accountability, and litigation have “strongly persuaded” government groups to actively court public input. The origins of such persuasion date back to the 1960’s, when public movements were abundant. During this time people began to demand that government be held increasingly accountable for protecting the environment (Dunlap, 1991). Passed in 1969, the National Environmental Policy Act (NEPA) represented the first significant piece of environmental legislation that held government accountable for environmental protection (Dunlap, 1991). Several other laws evolved from NEPA including the Resource Conservation and Recovery Act (RCRA) in 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1980. These three acts provided much of the initial impetus to involve the public in the protection of human health and the environment.

Today, the Environmental Justice (EJ) movement has placed an even stronger emphasis on involving the public in environmental decision-making. Over the past 15 years, a number of studies have provided evidence of environmental inequities in ethnic minority communities (Newton, 1996). Increasing evidence of such inequities has led to regulatory and legal oversight with respect to involving the public in environmental decision-making. Clinton’s introduction of Executive Order No. 12898 in 1994 served notice that environmental justice provisions must be part of *every* federal agency’s agenda (Newton, 1996). Federal and legal oversight have required the public and private sectors to look for ways to involve the public when siting or expanding facilities such as hazardous waste incinerators, manufacturing plants, and landfills.

However, environmental justice and human health and environment protection mandates are not the only motivation for involving the public in policy decisions. There is growing evidence that involving the public in environmental and technical decisions can decrease public opposition and thus facilitate positive changes (Cohen, 1995; Davis, 1985; Petts, 1995). The Presidential/Congressional Commission on Risk Assessment and Risk Management strongly advocates engaging the public throughout the environmental decision-making process (1997). The Commission cites numerous cases in which effective public involvement helped facilitate sound decisions. For example, proactive public engagement was used effectively to implement the San Francisco Bay pollution abatement program (Presidential Commission, 1997). Additionally, sound public involvement strategies were used to shape EPA’s initiatives for reducing industrial pulp and paper discharge (Presidential Commission, 1997).

## **Barriers to Involving the Public**

When it comes to public involvement, many governmental groups expend a great deal of resources and effort on something they cannot define. Currently, public involvement is at best an elusive goal for the government. Additionally, governmental definitions of public involvement are often diametrically opposed to those held by the public. Government and industry frequently offer involvement in the form of public meetings or hearings. Such meetings do nothing to address citizen groups' requests for active participation in decision-making. In many cases, there seems to be no "middle ground" on which government and the public may compromise. Frustrated experts argue that the public is not interested in participating and that involving activists and special interest groups is detrimental to the process (Kaplan and Kaplan, 1989; Lidskog, 1997; Petts, 1997). Others contend that the public is a legitimate participant in decision-making, particularly because science tends to frame issues such as environmental risk more narrowly than the public (Glicken, 1999; Petts, 1997).

Nonetheless, the benefits of effective public involvement are compelling. Research is gradually corroborating claims that public involvement enhances the decision-making process (Cohen, 1995; Davis, 1985; Petts, 1995). Rationales for public involvement are typically contextual. Perhac (1998) asserts that rationales for public involvement are at least threefold: (1) to ensure political viability of a program; (2) to define public values/ethics; and/or (3) to elicit knowledge possessed by the public. Additionally, he contends that the rationale for involvement may actually dictate exactly whose participation is solicited (Perhac, 1998). That is, members of the public are selected based upon their differing capacity to contribute to each of these three areas. For example, some citizens are recruited for advisory boards because they have specific expertise or represent a special interest group. Consequently, citizens who do not possess unique characteristics are often excluded from participating.

**Defining the Public:** Defining public involvement necessitates identifying exactly who in the public is to be involved. Many programs engage only a small often easily accessible sector of the citizenry (Cupps, 1977; Cohen, 1995). Many government officials equate "activists" with the public, irrespective of the fact that special interest groups only represent a small portion of a very diverse populace. No effort is made to identify the larger public, thus undermining the decision-making process. Consequently, many sectors of the public are underrepresented in public involvement programs and these underrepresented groups challenge decisions. Programs are frequently based upon the erroneous assumption that the public is a "single homogeneous, identifiable entity" (Pontius, 1998). Clearly, this is not the case.

There is some debate as to whether the public should be defined as a collection of individuals or as a collection of groups (Glicken, 1999). The public is comprised of individuals with diverse values, perceptions, and experiences that warrant full consideration in the decision-making process. Individuals participate through advisory boards that have been mandated by the government (Desario and Langton, 1987). Government mandated advisory boards often do not represent individual perspectives, rather they represent the rigidly defined resolutions of an appointed body

(Cohen, 1995; Gittel, 1983). Hence, much of the public feels left out. Arguably, the most effective strategies are those that combine “elements of the individualistic and pluralistic approaches” (Glick, 1999, p. 307). Despite a surplus of literature about “stakeholders,” a tangible definition of that term is virtually nonexistent. It is difficult to target public outreach efforts to a largely indistinguishable group of people. As evidenced by this discussion, characterizing the supposed public is not easy.

The public also varies widely with respect to context. Each community represents a unique social, economic, or political setting. The community setting may have a profound effect on individuals' perceptions and therefore on outreach programs. For example, what citizens tout as good outreach programs in one community may be perceived as paltry or irrelevant efforts in yet another. Therefore, outreach programs must address both the diversity of populations and the community as well.

**Reactive Public Involvement:** Public involvement often occurs in less than desirable circumstances. Public involvement often arises from the public's negative reaction to a single issue or event. For example, the identity of activist groups is often based upon a single issue such as “nuclear opposition” or “anti big-government.” The public's perceptions of inequity and potential detriment often drive opposition to public policy (Reagan and Fedor-Thurman, 1987). The environmental justice movement, for instance, serves as an example of public involvement that arose from the efforts of poor and ethnic minority groups to stop unfair environmental practices. Involvement that stems from perceived inequities often limits the ability of government agencies to foster productive working relationships with the public. That is, the public and government are put in an adversarial position from the beginning. As evidenced by the environmental justice movement, excluding the public in results in disparate public health risks, lost time, monetary liability, and public distrust. When the public is excluded from environmental decision-making, the public's reaction is typically more acute. People have a greater tendency to get involved when they believe an environmental problem or decision directly threatens their overall well being.

Perceived personal relevance may dictate public participation. Reagan and Fedor-Thurman (1987) state: “*the more closely the matter touches on the personal life of an individual the more likely the individual is to take the effort to participate in the hearing process...*” (p. 95). Unless an issue has an immediate impact on the individual or their respective community, participation rates are very low. For example, perceived health risks can evoke a tremendous amount of public anxiety (Reagan and Fedor-Thurman, 1987). People normally perceive the risks posed by hazardous waste facilities as “uncertain, long-term, imposed involuntarily, and associated with ‘dreaded’ outcomes” (Bord and O'Connor, 1992). Perceived risk and a communal sense of unfairness are often primary concerns for the populace (Feldman and Hanahan, 1996). Risks that are perceived as inequitable are especially troublesome for the public.

Economic threats can also incite intense public action. Environmental decisions that affect the local economy are likely to be closely scrutinized and influenced by the public. However, while increased jobs and tax base may make



certain decisions more acceptable for some residents, some suggest that citizens are not willing to trade economic gain for potential health risks (Davis, 1985; Kemp, 1990). Other studies have directly refuted this assertion (Sokolowska and Tysza, 1995; Williams, Brown, and Greenberg, 1999). Finally, the general characteristics of one's neighborhood may affect one's tendency to become involved (Greenberg, and Schneider, 1996). Numerous studies have indicated that distrust, heightened risk perception, and participation levels are all exacerbated by one's perception that his or her neighborhood quality is poor (Greenberg, Schneider, and Choi, 1994). Those living in less desirable communities often perceive an injustice and react accordingly.

**Conveying Technical Concepts to the Lay Public:** Public understanding of complex technical or scientific concepts is a sizable impediment to effective public involvement. Some argue that both technology and environmental risks are beyond the public's comprehension. Therefore, they contend that public involvement is rarely productive. This begs the question, "why should the lay public influence decisions which they do not understand?" There is a growing body of literature asserting that the public's inability to understand technical concepts should preclude them from technical decision-making (Cohen, 1995; Lidskog, 1997). For example, Kweit and Kweit (1997, p. 22) state that, "Citizens will often lack technical expertise; will almost certainly be unfamiliar with bureaucratic routines, and will probably be emotionally involved in issues of concern rather than being detached and rational." However, there is little evidence that technical knowledge is a requisite condition for public participation. Contrary to popular belief, knowledge in general is at best a very weak predictor of human behavior (Glanz, Lewis, and Rimer, 1990). Governmental programs often provide technical experts to the public or fund citizen's groups to select their own experts (Cohen, 1995). However, such efforts may be futile. Some studies have found that providing technical experts and information in response to increasing public demand does not necessarily enhance environmental management. There is a dearth of studies that examined the extent to which technical knowledge actually influences participation or acceptance of decisions.

### **Effective Public Involvement Programs**

As evidenced by the literature, simply providing the opportunity for involvement is not enough. Successful outreach programs create a productive environment in which the public *wants* to become involved. Effective outreach programs share similar characteristics that help them address the collective concerns of diverse populations and communities (Carnes, Schweitzer, Peelle, Wolfe, and Munro, 1998; Glick, 1999). First, the decision-making process allows full and active public representation. Every citizen is given a reasonable opportunity to participate. This provides the public with a sense of ownership concerning the resulting decisions. Consequently, the public is more accepting of decisions and the decision-making process. Additionally, for this approach to work, the institution and its clientele must understand and to some extent share each other's concerns. Secondly, effective programs do not involve the public just for the sake of involvement. Such programs use public participation to actually improve important decisions. Finally, effective outreach is based upon trust. Public acceptance and understanding of

decisions hinges largely upon the ability of program leaders to foster confidence and respect among their constituency.

The purpose of this paper is to delineate public involvement among residents living near the U.S. Army's Chemical weapons stockpile sites. Specifically, this study investigated the following three research questions: (1) To what extent do respondents *participate* in specific civic activities, and to what extent do respondents *intend* to participate in site-related decisions? (2) To what extent do psychological, social, economic, and programmatic factors influence a respondent's *civic participation* or *personal intent* to participate? (3) To what extent is a respondent's *civic participation* or *personal intent* to participate individually or contextually determined?

## **The Chemical Weapons Stockpile Community Study**

This study was conducted through a cooperative agreement between the University of Arizona and the U.S. Army's Program Manager for Chemical Demilitarization (PMCD). Although funded by the U.S. Army, researchers at the University of Arizona conducted this investigation independent of Army oversight. As mandated by international treaty, the primary charge of PMCD is to safely dispose of the U.S. Army's stockpile of chemical warfare materiel. Additionally, PMCD is required to engage the public and to integrate public input into the programmatic decision-making process. PMCD has been the target of much criticism concerning public involvement (Shepherd and Bowler, 1997). Critics of the program argue that public participation opportunities for the programmatic EIS were a "pro forma exercise" (Shepherd and Bowler, 1997, p.6). They also contend that Army decisions have been "unilateral, unfair, and unsafe" (Shepherd and Bowler, 1997, p.6). However, there is little empirical substantiation of such assertions. This study represents an effort to better understand the public's views concerning various aspects of chemical demilitarization so as to provide the foundation for more effective public outreach and education.

## **Methodology**

Researchers conducted a cross-sectional descriptive and analytical study of variables related to environmental risk perception, policy, and management in ten states. Preparation and planning of this investigation began in March of 1998 and ended in February of 1999. During the preparation phase of this study, secondary data sources were obtained and analyzed for the purpose of sample selection and stratification. Field-testing of research protocols and instrumentation was conducted between February and March 1999. Collection of primary data began in April 1999 and ended in July 1999.

### **Study Region Characteristics**

The U.S. Army's chemical stockpile sites are located in the following eight states: Alabama, Arkansas, Colorado, Indiana, Kentucky, Maryland, Oregon, and Utah. There is an additional chemical stockpile site located at Johnston Atoll in the Pacific Ocean, approximately 800 miles southwest of Hawaii. This site was not included in this

investigation. Only the Deseret Chemical Depot near Tooele, Utah and the Johnston Atoll Chemical Agent Disposal System are actively disposing of their chemical weapons stockpile. The estimated total population of the eight-site study region in 1997 was 1,234,896. The estimated population for the study area at each site is as follows: Anniston (n=326,175; Bluegrass (n=126,179); Edgewood (n=231,627); Newport (n=156,680); Pine Bluff (n=155,539); Pueblo (n=132,901); Tooele (n=31,410) and Umatilla (n=74,385).

### **Instrument Development: The Chemical Demilitarization Stakeholder Instrument (CDSI)**

The Chemical Demilitarization Stakeholder Instrument (CDSI) was systematically developed and reviewed by a broad cross section of residents, community activists, and government agency representatives living in the communities surrounding the chemical stockpile sites. At each location, a site specific “survey team” was convened. Overall, approximately 150 individuals agreed to serve on the survey teams. The primary purpose of convening these teams was to increase the likelihood that the scope, methods, and instrumentation were contextually appropriate for each given community being studied. Once established, each team was briefed concerning the purpose of the study and the nature of their participation. The teams were periodically reconvened as required by the developmental process.

**Identification of Survey Objectives:** Site specific survey teams systematically identified and prioritized objectives for the population survey. Using a quasi Delphi protocol, each team member was polled a total of four times over the course of about a three month period. The first two rounds of this protocol were designed to identify a manageable number of issues that the teams indicated were important. A list of 53 broad survey objectives was given to the teams, who were then asked to clarify and rate the importance of each objective. For example, a preponderance of survey team members identified “residents’ perceptions of risk” as an important topic for the CDSI to cover. Once the objectives were clarified and rated during round one, the list was condensed into 28 objectives and redistributed to the teams for use in round two. The next three rounds required members to rank order the content areas in order of importance so that more important areas would receive the most coverage on the CDSI. Group agreement was assessed using mean rank scores and coefficient of variation. Upon completion of round two, group consensus was high with respect to 16 of the 28 objectives.

During round three, the remaining 16 objectives were redistributed to the teams. The revised list was ranked in accordance with the overall group’s rankings. Members were asked to rank each content area again. During round four, this process was repeated. However, this time members were asked to rank each area within two places of the group’s aggregate rankings, thus considering the group’s collective opinion on the areas. Members were instructed that if they did not agree with the groups ranking within the two-place limit, then he or she should provide a brief rationale behind their divergent position. Upon completion of round four, content areas were prioritized using mean rankings and coefficient of variation. Additionally, researchers carefully examined dissenting opinions to help them understand areas in which consensus was not obvious. A final list of 16 objectives was constructed and prioritized

based upon the all the information obtained throughout the process (See Appendix A). The list of objectives was used as a “blueprint” for the CDSI. Using a table of specifications, an item pool was developed based upon the content area list generated from the team survey. A greater number of items were generated for “high priority” areas than for “low priority” areas.

**Focus Groups:** The site-specific survey teams were not the only people who provided input into the survey development process. At each of the eight sites, researchers conducted two focus groups, for a total of 16 focus groups. A total of 106 people participated in the focus groups. The purpose of the focus groups was to provide local citizens with the opportunity to identify objectives for the survey using a less formal assessment approach. Focus groups were conducted using a conventional nominal group process. Participants were asked three questions in which they eventually had to rank order their position on a given topic. Data were collected using field notes and standard rating scales. Each focus group was also videotaped, if the participants signed a written informed consent and video consent form. Taping the sessions allowed researchers to carefully review sessions later and capture information that was missed during the actual session. Data obtained from the sessions were used to structure the overall objectives for the survey and to generate survey items.

The CDSI is a closed and open-ended item questionnaire that was designed specifically for telephone interviewing (See Appendix B). A total of 124 items were developed and systematically field-tested for use in the CDSI. The large number of items was required to cover the entire breadth of areas identified by the survey teams. Consequently, three versions of the CDSI (A, B, and C) were composed to decrease respondent burden and to increase response rates. All three versions consist of 45 core items. Versions A, B, and C contain 85, 78, and 81 total items respectively.

Item functioning was assessed using classic item analysis. The entire item pool was field-tested before final inclusion in the CDSI. Seven hundred and seventy-one interviews (n=771) were completed during the field-test. Field-test data were used to evaluate items with respect to discrimination, difficulty, and reliability of intact scales. A point-biserial correlation was used to evaluate an item’s ability to differentiate among respondents answering in opposing directions. Only items with discrimination values above .30 were retained in the final version of the CDSI. Optimal difficulty levels (p-value) are a function of the item format. Dichotomous and 5-point Likert scale items were the primary item formats used in the CDSI. The optimal p-value for a dichotomous item is .75 and .60 for a five-option item. Only items with p-values within  $\pm .10$  optimal values were retained in the final version of the CDSI. Cronbach’s Alpha was used to estimate the internal consistency of intact scales. During field-testing, a Cronbach’s Alpha ( $\alpha$ ) of .80 was established as the minimal acceptable reliability for any given scale. Items that decreased the scale reliability below the .80 level were typically omitted. Data obtained from the actual study indicated that the mean Cronbach Alpha ( $\alpha$ ) for nine CDSI scales was .82.

The CDSI was comprised of ten intact scales. Likert-type scales included the Emergency Preparedness Scale (EPS), the Risk Perception Scale (RPS), the Outreach Awareness Scale (ORS), the Army Trust Scale (ATS), the Disposal Technology Characteristic Attribution Scale (DTCAS), the Army Descriptor Scale (ADS) and the Participation Intent Scale (PIS). Polychotomous scales included Emergency Preparedness Action Scale (EPAS), the Programmatic Awareness Scale (PAS), and the Civic Participation Scale (CPS). The Programmatic Awareness Scale (PAS) was not used in this analysis.

### **Quality Assurance/Control Procedures**

Researchers engaged in the following quality assurance and control procedures throughout the study: (1) field-testing and psychometric evaluation of instrumentation; (2) recruitment and standardized training of interviewer personnel; (3) objective testing of interviewer knowledge; (4) assessment of interviewer field performance and (5) standardization of interview administration protocols. The purpose of these procedures was to decrease the potential for interviewer/respondent bias, sampling bias, and other sources of systematic errors associated with the interview process.

### **Sampling**

Using random digit dialing (RDD), a total of 24,058 residents across the eight sites were called and asked to participate in the survey. RDD has been found to increase the generalizability of telephone surveys (Kristal et al., 1993). The total population for this eight-site region in 1997 was estimated at 1,234,896 (U.S. Census Bureau, 1999). The sample was stratified with respect to ethnicity and place of residence. Ethnic stratification was based upon the proportion of ethnic minority groups living within each of the eight respective regions.

Residential stratification was based upon the proportion of residents living within emergency response zones. These zones are used to plan and implement emergency evacuation and response protocols in case of an accidental release of chemical agent that travels beyond the perimeter of the site. Ten states and forty counties fall within the emergency response zones (Salter, 1999). At seven of the eight sites, emergency response zones are subdivided into Immediate Response Zones (IRZ) and Protective Action Zones (PAZ). At the Edgewood, Maryland site no such distinction is made. The IRZ and PAZ represent indicators of residential proximity to the outer perimeter of a given site. The IRZ represents a geographic area that directly borders the entire site, thus closest to where the chemical agent is stored. IRZs fall within an estimated six to nine mile radius of the site (Salter, 1999). PAZs fall within an estimated six to thirty-one mile radius of the site (Salter, 1999). The PAZ represents a geographic area that surrounds the entire IRZ. The ERZ in Edgewood, Maryland area does not differentiate with respect to residential proximity, it only designates a general area around the perimeter of the site as an emergency preparedness zone.

Respondents were delimited with respect to age, birthday, and residential zipcode. Only those individuals who were 18 years old or above and whose zipcode fell within the emergency preparedness zones were permitted to complete an interview. Once a contact was made within the home, the “next birthday” method was used to randomly select respondents “within” the home itself. Prior to beginning the interview, callers asked the person answering the telephone if there was anyone else in the home who is 18 years of age or older. If so, callers asked to speak to the person in the home whose birthday was next. If not, the person answering the telephone was permitted to complete the interview. This approach is advocated in the literature as a way to decrease sampling bias (Oldendick and Link, 1994; Oldendick et al. 1988; O’Rourke and Blair 1983).

**Sample Size:** Sample size was determined through power analysis. The range of variables to be investigated, the desired level of precision, confidence levels, the degree of sample variability and the estimated proportion of households in each county in the region with access to a phone were all factored into the analysis. Since a survey of precisely this nature had not been done previously, the variability of the variables being studied within the target population is unknown; thus, maximum variability ( $p = 0.5$ ) was assumed. A simplified power analysis formula for proportions was used for calculating sample size. In terms of sampling, residents living within the IRZ, PAZ, and ERZ were sampled within  $\pm 3\text{-}4\%$ ,  $\pm 4\text{-}5\%$ , and  $\pm 5\%$  margin of sampling error respectively. The power analysis indicated that approximately 8,000 respondents were needed to meet the above margins of sampling error.

### **Data Collection**

Data were obtained using a Computer Aided Telephone Interviewing (CATI) system. Telephone-based surveys generally evoke higher response rates than do mail computer, and household surveys, particularly in large population studies. Telephone numbers were obtained from a commercial sampling firm and downloaded to the CATI system. Calls were made between the hours of 8:00 a.m. and 9:00 p.m. (Mountain Time), Monday through Friday, and 10:00 a.m. to 3:00 p.m. on Saturday and Sunday. If initial contact was not made with a given number, then the number was “called-back” at least 10 times before it was eliminated from the sample. In order to maximize the use of sample pools, some numbers were called as many as 20 times before elimination.

Once contact was made, the interviewer undertook the following procedures. First, the interviewer stated the purpose of the call and had the respondent confirm his or her telephone number, zipcode, and state of residence. Secondly, as described previously, the interviewer solicited the participation of the adult person in the household having the next birthday. Once the respondent met the delimiting criteria, he or she was read an informed consent and subsequently asked if he or she would volunteer to participate. The informed consent described how any respondent could terminate his or her participation at any point in the interview, or decline to answer any question without risk of reprisal or could reschedule the interview at a more convenient time. Investigators were required by our Institutional Review Board to obtain verbal Informed Consent from each participant. If consent was given for the interview, the subject was then automatically assigned a respondent ID code by the CATI system to identify his

or her responses. The ID code was separated from any potential identifiers of the respondent (e.g., name, address, telephone number, etc.). Each respondent's answer to specific items (e.g., open-ended items) was recorded directly into the computer to limit the potential for data transfer error.

## **Research Variables**

**Individual Level Variables:** Participation in Civic Activities and Participation Intent represent the two *criterion* variables included in this analysis. The Civic Participation Scale and the Participation Intent Scale measured the two criterion variables respectively. Individual and site level factors were used as predictor variables for this analysis. Individual-level *predictor* variables were obtained from the CDSI. These variables included emergency preparedness, perceptions of risk, awareness of outreach, trust in the Army, attribution of disposal technology characteristics, and respondent socioeconomic characteristics. The predictor variables were measured by the Emergency Preparedness Scale, the Risk Perception Scale, the Outreach Awareness Scale, the Army Trust Scale, the Disposal Technology Characteristic Attribution Scale, and respondent characteristic items respectively.

**Community Level Variables:** A total of 26 community level variables were included in the analyses. The value of each variable is illustrated in Table 1.0 below. Categories of variables included population indices, birth and death rates, violent crime rates, literacy rates, economic indices (e.g., poverty), voter characteristics, political control, site characteristics, outreach characteristics, and number of known activist groups. Mean values were calculated for each variable whenever appropriate. Once calculated, each mean value was weighted in direct proportion with the estimated population within the geographic area sampled. Each respondent was assigned a site-specific value for each of the 26 community variables. For example, all respondents living in the Anniston area would have been assigned a value of "5.13" for violent crime rate.

**Table 1.0 Community Level Variables by Site**

	SITE							
	Anniston	Blue Grass	Edgewood	Newport	Pine Bluff	Pueblo	Tooele	Umatilla
Pupil/Teacher ratio by Site	18.24	16.42	16.99	22.66	16.92	16.20	21.37	16.94
Population Density	156.63	120.40	1015.30	71.80	72.83	54.84	1082.93	18.3
% Population Change	1.24	6.35	2.85	-1.24	3.39	5.77	5.84	5.29
% Population >65 Change	1.28	5.59	8.02	-3.25	-.72	3.39	3.89	.92
% Change in Birth rate	3.07	5.59	-.20	-6.10	5.48	2.46	11.32	3.89
Age Adjusted Death Rate	626.71	485.13	471.03	547.20	595.32	481.00	434.76	493.3
Crude OBS Death Rate	1144.36	831.62	892.53	1191.20	1009.14	991.60	576.71	918.86
Violent Crime Rate	5.13	1.50	6.19	.58	7.28	9.31	3.51	1.65
% 1990 Population at Level 1 Literacy	24.43	17.41	15.24	17.19	25.17	21.00	11.11	18.00
% Students Free Lunch Eligible	37.30	33.00	19.02	6.73	33.10	35.90	18.17	31.75
Total Site Population 1996	322985	124577	944889	156564	154293	130997	857830	73788
Number of Counties in Analysis by Site	5	4	3	5	4	1	2	2
% Population in Poverty	18.15	18.46	6.45	12.54	20.21	18.30	8.82	15.91
% Population K-12	17.12	16.29	15.31	20.18	22.53	18.03	22.11	19.89
Businesses Established / Population	.015	.017	.022	.020	.018	.025	.027	.025
Median Income	26952	28131	42021	29919	29676	27589	39467	30021
Number of Activist Groups	4	2	3	1	3	1	4	3
Outreach Office Full Time Employees	3	2	2	2	4	1	4	3
Number of Four-Year Colleges in Area	1	2	4	0	1	1	2	1
Total Registered Voters	164639	77479	466997	96459	75590	82601	477319	43058
General Election Turnout Avg.	56.60	49.40	64.74	45.65	50.86	55.00	48.00	55.88
Activist Groups/Population	.000013	.000016	.000003	.000006	.000019	.000008	.000005	.000041
Site's Mission Post-Demil <sup>a</sup>	2	2	2	1	2	1	1	1
Governor's Political Affiliation <sup>b</sup>	2	2	2	2	1	1	1	2
Senate Party Control <sup>c</sup>	1	1	2	3	3	1	1	3
State House Party Control <sup>d</sup>	2	2	2	2	2	1	1	1

Note: All mean values are weighted by population sampled.

a. 1=No Further Mission, 2=Continued Missions

b. 1=Republican, 2=Democrat

c. 1=Republican, 2=Democrat, 3=Split

d. 1=Republican, 2=Democrat



## Treatment of Data

The intent of the analysis was to establish a model that can assist in the prediction of public perceptions and behavior. The most commonly used statistical method to identify predictive models of this type is the Ordinary Least Square (OLS) multiple regression method. However, the potential predictor variables used in this study can be divided into two different types: *Personal* variables such as occupation, participation in public affairs, family size, and educational level; and *community* variables such as population density and the number of activist groups in the community. These two types of variables contain different statistical characteristics. Specifically, all individuals within the same site share the same set of community characteristics while these same individuals may differ among themselves in personal characteristics. Statistically, this is referred to as a nested design in that individuals reside (are nested) within sites. For the purpose of statistical analyses and for meaningful interpretation of results from these analyses, this nested design presents a number of known technical problems (e.g., aggregation bias, unit of analysis problem, misestimated precision problem).

In order to resolve these problems and to produce the most reliable and stable prediction models, the Hierarchical Linear Modeling (HLM) method, which is specifically designed for this type of multilevel, nested data structure, is used (Arnold, 1992). When applied to this study, the HLM analysis approach essentially divides the prediction problem into two sets of prediction questions at two different levels:

1. What personal variables can predict a person's civic participation and participation intent?
2. How will the prediction models for Question 1 change as a function of the values of the community variables for the site in which the person resides?

To illustrate symbolically, using  $Y$  to represent the dependent variable of interest and  $X_1, X_2, \dots, X_k$  (e.g., religion, education, occupation) to represent different personal variables, we can attempt to answer the Question 1 by identifying the best linear regression equation of the form:

$$Y = b_0 + b_1 X_1 + b_2 X_2 \dots + b_k X_k + e \quad (1)$$

where the  $\beta$ 's are regression weights and  $e$  is the error of prediction. This equation is referred to as the *Level-1 Model*.

To answer Question 2 above, we use symbolically  $Z_1, Z_2, \dots Z_m$  (e.g., proximity to disposal site, number of activist groups) to represent community variables. We attempt to predict how the  $\beta$  values in Equation (1) will change as a function of these  $Z$  values by estimating:

$$\begin{aligned}
 b_0 &= g_{00} + g_{01}Z_1 + g_{02}Z_2 + \dots + g_{0m}Z_m + u_0 \\
 b_1 &= g_{10} + g_{11}Z_1 + g_{12}Z_2 + \dots + g_{1m}Z_m + u_1 \\
 b_2 &= g_{20} + g_{21}Z_1 + g_{22}Z_2 + \dots + g_{2m}Z_m + u_2 \\
 &\dots \\
 &\dots \\
 b_k &= g_{k0} + g_{k1}Z_1 + g_{k2}Z_2 + \dots + g_{km}Z_m + u_k
 \end{aligned} \tag{2}$$

where the  $\gamma$ 's are regression weights and the  $u$ 's are errors of prediction. These are referred to as *Level-2 Models*. As the intercept and regression weights in the Level-1 model are determined by the  $Z$  values in the Level-2 models, community variables would influence how personal variables can predict a person's risk-related perceptions.

### Analysis Procedure

**Exploratory Analysis Steps:** Through a large-scale survey, researchers established a comprehensive data set containing information gathered from over 8,000 individuals from eight different chemical weapons stockpile communities. This database contains information for numerous personal variables and community variables. The main goal of the analysis is to identify the best predictors of a person's score on a number of outcome variables (e.g., Participation Intent score, (DESCSUM), Civic Participation score, (PARTSUM)). However, there is no strong *a priori* theory that may suggest specific predictor variables. Therefore, to conduct the HLM analysis in practice, we used an exploratory approach. Specifically, we performed each of the following steps for each of the desired dependent variables:

1. The database containing all the variables of interest were examined carefully for missing data and other irregularities such as extreme skewedness. Appropriate transformations, mean substitutions, and the creation of subsets of data were performed to assure the most robust data set for analyses.
2. As mentioned previously, scale scores were generated for various subscales by summing appropriate items within these scales. Specifically, the following scale scores were created:

- Participation Intent Score (DESCSUM) is the sum of the scores for the seven polychotomous items (DESC\_1 to DESC\_7). This variable indicates "*intent to participate*." The higher the Participation Intent score (DESCSUM), the more a respondent is personally ready to participate in site-related decisions.
  - Risk Perception Score (ACTYSUM) is the sum of the scores for the 13 Likert scaled items (ACTY\_1 through ACTY\_14). This variable indicates a person's perception of risk associated with site or site activities. The higher the Risk Perception score (ACTYSUM), the more a respondent perceives a susceptibility to an adverse outcome associated with the site.
  - Civic Participation Score (PARTSUM) is the sum of the scores for nine polychotomous scaled items (PART\_1 through PART\_9). This variable indicates the level of "civic participation." The higher the Civic Participation score (PARTSUM), the more a respondent participates in civic activities.
  - Outreach Awareness Score (PGSUM) is the sum of the scores for nine Likert scaled items (PGM\_1 through PGM\_\_8). This variable indicates the respondent's perceived awareness and value of public outreach. The higher the Outreach Awareness score (PGSUM), the more the respondent is aware and values public outreach activities currently taking place at the site.
  - Incineration Score (INCINSUM) is the sum of all the responses to eleven polychotomous items (INEUT\_1 through INEUT\_11). This variable indicates the degree to which a respondent attributes positive characteristics with the incineration method of disposal. The higher the Incineration score (INCINSUM), the more the respondent has ascribed positive traits to incineration.
  - Neutralization Score (NEUTRSUM) is the sum of all the responses to eleven polychotomous items (INEUT\_1 through INEUT\_11). This variable indicates the degree to which a respondent attributes positive characteristics with the neutralization method of disposal. The higher the Neutralization score (NEUTRSUM) the more the respondent has ascribed positive traits to neutralization.
3. The data prepared in the above manner were submitted to an ordinary least square regression analysis through the SPSS (Statistical Packages for Social Sciences) software using only personal variables. The purpose of this analysis is to identify statistically significant level-1 predictor variables to improve the efficiency of subsequent analyses.
  4. The data were then submitted to an HLM analysis through the software HLM (v.4.01) using only significant level-1 predictor variables identified from Step 2 above. For the level-2 variables, all variables of potential interest were examined one-by-one in an exploratory process to identify significant level-2 predictors.

5. After the final set of significant level-1 and level-2 variables have been identified through step 3, a final HLM analysis using only these variables was performed to estimate the final set of parameters.
6. The above process is repeated for each dependent variable of interest and each appropriate subset of data created.

**Generating Subsets of Data:** Because of the use of different versions of certain scales within the overall CDSI, several independent and dependent variables suffered severe problems of missing data primarily due to non-overlapping items. If these variables were included in the overall analysis, following the common listwise deletion method for the treatment of the missing data would have resulted in no usable data at all. To remedy this problem, it was necessary to create subsets of data so that all variables can be investigated. Therefore, the following data sets were generated from the overall survey database:

**Global Data Set:** This set of data contains responses to all items from all subjects in the overall survey, except for data related to the following variables: Risk Perception Score (ACTYSUM), Civic Participation Score (PARTSUM), Incineration Score (INCINSUM) and Neutralization Score (NEUTRSUM). These four variables were excluded entirely from this data set. There are a total of 8,223 respondents in this data set.

**Risk Perception Data Subset:** Both the Risk Perception scale and the Disposal Technology Characteristic Attribution scale in the overall data set had several non-overlapping versions. In order to include Risk Perception Score (ACTYSUM), Incineration Score (INCINSUM), and Neutralization Score (NEUTRSUM) in an analysis simultaneously, we selected only subjects who responded to Version B of the Risk Perception scale. Any other combination would have resulted in having no subjects at all. There are a total of 2,572 respondents in this subset of data.

**Participation Data Subset:** Again, both the Civic Participation scale and the Disposal Technology Characteristic Attribution scale in the overall data set had several non-overlapping versions. In order to include Civic Participation Score (PARTSUM), Incineration Score (INCINSUM) and Neutralization Score (NEUTRSUM) in an analysis simultaneously, we selected only subject who responded to Version A of Civic Participation Scale. There are a total of 2,539 respondents in this subset of data.

Following the exploratory steps described earlier, each of these three data sets were analyzed to identify predictors of Participation Intent (DESCSUM) and Civic Participation Score (PARTSUM) (civic participation).

## Results

### Response Characteristics

Interviewers made 24,058 telephone contacts from April to July 1999. Approximately 10,183 residents agreed to participate in the study, 8,315 of these residents completed the entire survey. A total of 2.9% of respondents had participated in a survey within the past year. The literature suggests that refusal rates increasingly pose a source of bias for telephone surveys (Hox and Leeuw, 1994; Schmidley, 1986; Smith, 1995). The rate of respondent refusal to participate in this study is comparable to that of other large population surveys (Smith, 1995; Luevano, 1994; Davis and Smith, 1992).

The *immediate refusal rate* was 53% across all sites and ranged from 36% in Umatilla, Oregon to 61% in Edgewood, Maryland. Immediate refusals occur very early in the contact with a potential respondent before the respondent is given a description of the survey. The vast majority of immediate refusals come within the first minute of the contact, well before the interviewer has an opportunity to encourage the person to respond. This refusal rate is sometimes referred to as a “cold refusal” or a “phone slam.” Given the public’s increasing annoyance with “telemarketers,” some researchers have questioned the efficacy of using immediate refusals as an indicator of willingness to respond (Baker, 1996; Whitlark and Geurts, 1998; Reagan, Pinkleton, Aaronson, and Ramo, 1995).

Some survey research groups attempt to decrease immediate refusals by calling a respondent after he or she has declined to participate. A respondent may be called as many as 2-3 times, before a respondent gives a “final” refusal. Although refusals can be reduced through such follow-up, calling back unwilling respondents poses both ethical and methodological concerns. First, “voluntary participation” represents a fundamental principle of ethical human subjects research. Secondly, there is some question concerning the extent to which a given respondent’s answers are biased by interviewer “pressure” to participate. For example, interviewers may not develop a good rapport with pressured respondents, thus limiting or altering disclosure. There is insufficient evidence in the literature documenting the effects of following up on refusals. Consequently, more research is needed before such practices become more commonplace.

In this study, interviewers were not allowed to call an unwilling respondent back. In accordance with the University of Arizona Institutional Review Board directives, researchers must adhere to a respondent’s wishes to end his or her participation at any time during the study. Once informed of the purpose of this study, the vast majority of residents (79%) agreed to participate. This rate is comparable with that of other large population surveys (Smith, 1995; Luevano, 1994; Davis and Smith, 1992). The *refusal rate after consent* was 21% across all sites and ranged from 12% in Umatilla, Oregon to 28% in Pine Bluff, Arkansas. Of the 10,183 residents who agreed to participate, 8,315 residents completed the entire survey and 1,272 residents partially completed the survey process.

## Sample Characteristics

Using 1997 projective U.S. Census data for comparison, the demographic characteristics of the sample were similar to demographic characteristics of the eight-state study region. In terms of *race*, 7% of this sample self-identified as African Americans as compared to approximately 13% of eight-state study region. In the sample, 87% of the respondents identified themselves as Caucasian, while the actual percentage of Caucasians in the study region was estimated at 86% for all Whites, regardless of ethnicity. Native Americans constitute approximately 1% of the population in the study region and comprised slightly more than 1% of the sample. With respect to *ethnicity*, 6% of the study region are Hispanic while 5% of the sample self-identified as Hispanic.

The sample and study region differed slightly with respect to age distribution. The age distribution comparisons are based upon the *population eligible* to participate in the study: i.e. those over the age of 18. However, the age intervals for U.S. Census data start at 15 years of age not 18. Hence, the age distribution data for the study region are likely underestimated to a small degree. This probably accounts for the small disparities between the sample and study region. In the study region, 27% of residents were between the ages of 25 and 39 as compared to 30% in the sample. In the study region, 38% of residents were between the ages of 40 and 64 and 9% were between the ages of 65 and 74. Of those sampled, 46% were between the ages of 40 and 64 and 9% were between the ages of 65 and 74. Both the sample and study region consist of a relatively small percentage of people over the age of 74. In the study region, 7% of residents were over the age of 74 as compared to 4% of those in the sample.

In terms of *income*, the study region and the sample residents have similar profiles. The average median annual income for the study region is \$30,000. In the sample, 19% reported an income between \$25,000 and \$35,000 per year and 24% reported an income between \$35,000 and \$50,000 per year. These categories represented the greatest proportion of respondents in the sample. In the study region, the mean proportion of persons of all ages in poverty is 15%. The proportion is 16% for those in the sample with a family size of 4 or greater and reported incomes of \$25,000 or less.

The sample and study regions were also comparable with respect to gender. In the study region, 49% of the respondents identified as male. In the sample 41% of respondents identified as male. Although males are typically underrepresented in population surveys, the male representation in this sample is comparable to other large population surveys.

## Participation in Civic Activities

Each respondent reported the number of activities in which he or she has participated within the past year. The *Civic Participation Scale* (CPS) was used to measure the reported participation among respondents. A respondent was

asked whether or not he or she had participated in each one of a selected group of 9 civic activities within the past year. Hence, scores on the CPS ranged from “0” to “9.” Table 2.0 provides a breakdown of mean participation in civic activities by site and across sites.

**Table 2.0**  
**Mean Number of Civic Activities Performed in the Past Year by Site and across Sites**

		SITE								Across Sites
		Anniston	Bluegrass	Edgewood	Newport	Pine Bluff	Pueblo	Tooele	Umatilla	
<b>Participation Score</b>	<b>Mean</b>	2.46	2.35	2.50	2.09	2.61	2.77	2.79	2.28	2.50
	<b>Std Deviation</b>	1.83	1.82	1.81	1.78	1.82	1.93	1.95	1.94	1.88

As illustrated in Table 2.0, all sites fell within  $\pm .5$  points of the overall mean participation score. Although the sites’ scores were similar, significant differences ( $F=11.3$ ;  $p=.000$ ) were demonstrated in mean participation across the sites. Tooele demonstrated the highest level of civic participation with a 2.79 mean score while Newport demonstrated the lowest level of civic participation with a mean score of 2.09. Using a Tukey’s post hoc comparison, the Newport, Umatilla, Bluegrass, Anniston, and Edgewood sites represented a homogeneous subset of “low” mean participation scores ( $p = .001$ ).

Overall, respondents reported taking part in either a church or civic function more frequently than any other form of civic participation. Approximately 25.3% of respondents reported “volunteering for a church or civic function” within the past year. The next most frequently performed activity was “signing a petition” with 17.6% of respondents having done so. Reported participation in the next three civic activities was quite similar: approximately 13.6% of respondents reported “attending a public meeting,” 13.0% reported “calling the police,” and 12.4% reported “contacting an elected official” within the past year. The next most frequently performed activity was “organizing a neighborhood function”; with 7.6% of respondents having done so. The lesser performed activities included “writing a letter to a newspaper editor,” “participating in a public protest,” and “participating in labor union activities.” Approximately 4.3%, 4.0%, and 2.2% of respondents reported participating in each of these activities respectively. Overall, 16.9% ( $n=5,529$ ) of respondents had not participated in a single civic activity within the past year.

### Intent to Participate in the Chemical Demilitarization Program

Each respondent characterized the extent to which he or she was “ready” to participate in the chemical demilitarization program. The *Participation Intent Scale* (PIS) was used to measure a respondent’s willingness and ability to participate in program-related activities. Each respondent was presented with 7 statements concerning his or her intent to participate. Each respondent indicated whether or not a statement described him or her. Scores on the CPS ranged from “0” to “7,” with “0” indicating the lowest level of participation intent and “7” signifying the highest level of participation intent. Table 3.0 provides a breakdown of mean participation intent by site and across sites.

**Table 3.0**  
**Mean Participation Intent Score by Site and across Sites**

		SITE								Across Sites
		Anniston	Bluegrass	Edgewood	Newport	Pine Bluff	Pueblo	Tooele	Umatilla	
<b>PARTSUM</b>	<b>Mean</b>	4.96	4.70	4.58	4.64	4.74	4.59	4.99	4.91	4.77
	<b>Std Deviation</b>	1.41	1.50	1.50	1.53	1.53	1.45	1.49	1.46	1.49

As illustrated in Table 3.0, all sites fell within  $\pm .25$  points of the overall mean participation score. Although the sites’ scores were similar, significant differences ( $F=13.4$ ;  $p=.000$ ) were demonstrated in mean intent scores across the sites. Tooele demonstrated the highest level of intent score with a 4.99 mean score while Edgewood demonstrated the lowest level of participation intent with a mean score of 4.58. Using a Tukey’s post hoc comparison, the Anniston, Pine Bluff, Tooele, and Umatilla sites represented a homogeneous subset of “high” mean participation intent scores ( $p = .003$ ).

Overall, 94.2% of the 8,312 respondents answering these items indicated that they “wanted to be informed about chemical weapons disposal.” Three items appeared to describe most respondents. Approximately 74.6% of respondents indicated that they were “aware of the chemical weapons disposal process,” 70.7% indicated they “would like to participate in site decisions so long as they live in the area,” and 65.4% indicated they “are interested in participating in site decisions.” The remaining three items did not describe the majority of respondents. Approximately 49.2% of respondents indicated that they “understand how the Army disposes of chemical weapons,” 42.5% indicated they “know how to participate in site decisions,” and 11.4% indicated they have “tried to participate



in site decisions but quit because they did not feel their participation made a difference.” Overall, only .1% (n=8) of respondents indicated that none of the 7 statements described them.

### Participation Intent Analysis I: Global Data Set

**Results:** The Global data set contains responses from 8,223 subjects. These subjects came from eight different sites and their distribution is as shown in Table 4.0 below.

**Table 4.0 Distribution of respondents among sites for the global data set**

		Number of Respondents
Site		
	Anniston	1018
	Blue Grass	1026
	Edgewood	931
	Newport	962
	Pine Bluff	1106
	Pueblo	1066
	Tooele	1171
	Umatilla	943

When the Global data set was analyzed, three (3) significant level-1 (i.e., personal characteristics) predictors of Participation Intent Score (DESCSUM) were found. These were Outreach Awareness (PGSUM), Perceived Community Impact Score (IMPACT), and SEX. Perceived Community Impact Score (IMPACT) refers to the respondent's perception of the impact of the site on the community. This variable was scored as 1=positive effect, 2=neutral effect; and 3=negative effect. That is, the higher the Perceived Community Impact (IMPACT) score, the more a person perceives the site as having a negative impact on the community. SEX refers to the sex of the respondent. This variable was scored as 1=male and 2=female. However, none of the level-2 (i.e., community characteristics) variables was a significant predictor. The maximum-likelihood level-1 prediction equation for Participation Intent Score (DESCSUM) based on this analysis was found to be:

$$\text{Predicted DESCUM} = 4.736 + 0.051(\text{PGMSUM}) - 0.017(\text{IMPACT}) - 0.295(\text{SEX}) \quad (3)$$

The standard error of the predicted Participation Intent (DESCSUM) score from Equation 3 is 1.429. This equation was derived based on centering all three predictor variables on their respective grand means. The standard errors and significance of the coefficients for Equation 3 are shown in Table 4.1

**Table 4.1: Standard errors and significance for Equation 3**

		Coefficient	Standard Error	T-Ratio	P-Value
Variable	Intercept	4.736	.048	97.709	.000
	PGMSUM	.051	.004	14.291	.000
	IMPACT	-.017	.004	-4.209	.005
	SEX	-.295	.046	-6.413	.000

**Interpretation:** Equation 3 suggests that individuals with high awareness and value of public outreach, who perceive a positive impact of the site on the community, and who are males tend to have higher intent to participate. Females, individuals who perceive a negative impact, and individuals with a low level of awareness and value of public outreach tend to have lower intent to participate. Because the metrics for all three predictor variables were centered around their respective grand means, the intercept of 4.736 in Equation 3 represents the expected (i.e., average) Participation Intent (DESCSUM) score of the typical respondent. To predict the Participation Intent (DESCSUM) score of any given subject, instead of using the raw Outreach Awareness Score (PGSUM), Perceived Community Impact (IMPACT), and SEX scores, we use the subject's deviation scores on these variables. That is, this equation is applied to the deviation scores of the independent variables only. The deviation score of a subject on a particular variable is obtained by subtracting the subject's score on that variable from the grand mean of that variable. That is, instead of "what is the raw score of the subject," we are interested in "how many points is the subject above or below the mean." To facilitate the application of Equation 3, Table 4.2 provides the grand mean scores for each of the predictor variables as well as for Participation Intent (DESCSUM).

**Table 4.2: Mean and standard deviation of predictor variables in Equation 3**

		N	Mean	Standard Deviation
Variable	DESCSUM	8220	4.772	1.492
	PGMSUM	8223	24.083	7.317
	IMPACT	7599	1.923	.877
	SEX	8218	1.588	.492

## Participation Intent Analysis II: Risk Perception (ACTY) Data Subset

**Results:** The ACTY data subset data set contains responses from 2,572 subjects. These subjects came from eight different sites and their distribution is as shown in Table 5.0 below.

**Table 5.0: Distribution of respondents among sites for the ACTY data subset**

		Number of Respondents
Site		
Anniston		308
Blue Grass		328
Edgewood		296
Newport		322
Pine Bluff		293
Pueblo		343
Tooele		368
Umatilla		314

When the ACTY data subset was analyzed, four (4) significant level-1 predictors of Participation Intent (DESCSUM) were found. These were Risk Perception Score (ACTYSUM), Outreach Awareness Score (PGSUM), Incineration Score (INCINSUM) and COLLEGE. COLLEGE is a dummy-coded variable. A value of 1 indicates that the respondent has completed at least a college education. A value of 0 indicates that the respondent has less than a college education. Again, none of the level-2 variables was a significant predictor of Participation Intent (DESCSUM). The maximum-likelihood level-1 prediction equation for Participation Intent (DESCSUM) based on this analysis was found to be:

$$\text{Predicted DESC SUM} = 4.783 + 0.036(\text{ACTYSUM}) + 0.035(\text{PGMSUM}) + 0.138(\text{INCINSUM}) + 0.489(\text{COLLEGE})$$

(4)

The standard error of the predicted Participation Intent (DESCSUM) score from Equation 4 is 1.247. Equation 4 was derived based on centering Risk Perception Score (ACTYSUM), Outreach Awareness Score (PGSUM), and Incineration Score (INCINSUM) on their respective grand means. COLLEGE, however, was not centered. The standard errors and significance of the coefficients for Equation 4 are shown in Table 5.1.

**Table 5.1: Standard errors and significance for Equation 4**

		Coefficient	Standard Error	T-Ratio	P-Value
Variable	Intercept	4.783	.104	45.973	.000
	ACTYSUM	.036	.015	2.350	.051
	PGMSUM	.035	.013	2.739	.029
	INCINSUM	.138	.031	4.488	.003
	COLLEGE	.489	.137	3.552	.011

**Interpretation:** Equation 4 suggests that individuals who perceive a high risk associated with the site, those who have high levels of awareness and value of public outreach, those who associate positive characteristics with incineration, and those with at least a college education tend to be higher in intent to participate. The metrics for Risk Perception Score (ACTYSUM), Outreach Awareness Score (PGSUM), and Incineration Score (INCINSUM) were centered on their respective grand means. However, COLLEGE was uncentered. Consequently, the intercept of 4.783 represents the expected Participation Intent (DESCSUM) score of a subject with an average Risk Perception (ACTYSUM) score, an average Outreach Awareness (PGSUM) score, and an average Incineration Score (INCINSUM) (i.e., typical subject on these three variables) *and who has less than a college education*. For a typical (i.e., average Risk Perception Score (ACTYSUM), Outreach Awareness Score (PGSUM), and Incineration Score (INCINSUM)) subject *with at least a college education*, the expected Participation Intent (DESCSUM) score is the intercept plus the COLLEGE regression coefficient; that is,  $4.783 + 0.489 = 5.272$ . Again, to predict the Participation Intent (DESCSUM) score of any given subject, the deviation scores of Risk Perception (ACTYSUM), Outreach Awareness Score (PGSUM), and Incineration Score (INCINSUM) are used; but the raw score (i.e., raw dummy code) of COLLEGE is used. To facilitate the application of Equation 4, Table 5.2 provides the grand mean scores for each of the predictor variables as well as for Participation Intent Score (DESCSUM).

**Table 5.2: Mean and standard deviation of predictor variables in Equation 4**

		N	Mean	Standard Deviation
Variable	DESCSUM	2572	4.759	1.477
	ACTYSUM	2572	17.105	6.311
	PGMSUM	2572	24.112	7.335
	INCINSUM	2572	4.722	2.913

#### Civic Participation Analysis III: PART Data Subset

**Results:** The PART data subset contains responses from 2,539 subjects. These subjects came from eight different sites and their distribution is as shown in Table 6.0.

**Table 6.0: Distribution of respondents among sites for the PART data subset**

		Number of Respondents
Site	Anniston	320
	Blue Grass	326
	Edgewood	293
	Newport	301
	Pine Bluff	309
	Pueblo	334
	Tooele	362
	Umatilla	294

When the PART data subset was analyzed, using *Civic Participation Score (PARTSUM)* as the outcome variable, two (2) significant level-1 predictors of Civic Participation Score (PARTSUM) were found. These were COLLEGE and FAMSIZE. FAMSIZE is family size and indicates the number of individuals in the household of the respondent. Again, none of the level-2 variables was a significant predictor of Participation Intent (DESCSUM). The maximum-likelihood level-1 prediction equation for Participation Intent (DESCSUM) based on this analysis was found to be:

$$\text{Predicted PARTSUM} = 2.228 + 0.777(\text{COLLEGE}) + 0.143(\text{FAMSIZE}) \quad (5)$$

The standard error of the predicted Civic Participation Score (PARTSUM) score from Equation 5 is 1.799. Equation 5 was derived based on centering FAMSIZE and leaving COLLEGE uncentered. The standard errors and significance of the coefficients for Equation 5 are shown in Table 6.1.

**Table 6.1: Standard errors and significance for Equation 5**

		Coefficient	Standard Error	T-Ratio	P-Value
Variable	Intercept	2.228	.083	26.967	.000
	COLLEGE	.777	.085	9.135	.000
	FAMSIZE	.143	.025	5.638	.000

**Interpretation:** Equation 5 suggests that those from large households and those with at least a college education tend to report higher levels of civic participation. FAMSIZE was centered on its grand mean and COLLEGE was not centered. Consequently, the intercept of 2.228 represents the expected Civic Participation (PARTSUM) score of a subject with an average FAMSIZE *and who has less than a college education*.. The expected Civic Participation (PARTSUM) score of subject with an average FAMSIZE *and who has at least a college education* is  $2.228 + 0.777 = 3.005$ . Again, to predict the Civic Participation (PARTSUM) score of any given subject, deviation scores of FAMSIZE were used, but the raw score of COLLEGE was used. To facilitate the application of Equation 5, Table 9 provides the grand mean scores for FAMSIZE and Civic Participation Score (PARTSUM).

**Table 6.2: Mean and standard deviation of predictor variables in Equation 5**

		N	Mean	Standard Deviation
Variable	PartSum	2539	2.551	1.868
	FamSize	2523	2.849	1.433

#### Participation Intent Analysis IV: PART Data Subset

**Results:** This analysis used the same set of data in as Analysis III; i.e., the PART data subset. The only difference is that, in Analysis IV, the best model to predict Participation Intent (DESCSUM) (instead of Civic Participation Score) was identified. When the PART data subset was analyzed, *using Participation Intent (DESCSUM) as the outcome variable*, two (2) significant level-1 predictors were found. These were Incineration Score (INCINSUM) and Neutralization Score (NEUTRSUM). Additionally, a significant level-2 predictor variable was found. This was defined as N\_GROUPS, which indicates the number of activist groups in the community. N\_GROUPS was found

to influence the slope of Neutralization Score (NEUTRSUM) in the level-1 equation; i.e., the N\_GROUPS value of a community will influence how the resident's opinion about neutralization technology in that community relates to that person's intent to participate. The maximum-likelihood level-1 prediction equation for Participation Intent (DESCSUM) based on this analysis was found to be:

$$\text{Predicted DESCsum} = 4.845 + 0.121(\text{INCINSUM}) + \beta_2(\text{NEUTRSUM}) \quad (6)$$

and the corresponding level-2 equation is:

$$\text{Predicted } \beta_2 = 0.103 - 0.027(\text{N\_GROUPS}) \quad (7)$$

The standard error for the predicted Participation Intent (DESCSUM) score from Equations 6 and 7 is 1.403. Equations 6 and 7 were derived based on centering Incineration Score (INCINSUM) and Neutralization Score (NEUTRSUM) on their grand means and leaving N\_GROUPS uncentered. The standard errors and significance of the coefficients for Equations 6 and 7 are shown in Table 7.0.

**Table 7.0: Standard errors and significance for Equations 6 and 7**

		Coefficient	Standard Error	T-Ratio	P-Value
Variable	Intercept	4.845	.056	86.470	.000
	INCINSUM	.121	.012	9.701	.000
	NEUTRSUM	.103	.030	3.400	.013
	Intercept				
	N_Groups	-.027	.010	-2.573	.037

**Interpretation:** Equations 6 and 7 suggest that those who have a positive view about incineration tend to have higher levels of intent to participate. A positive view about neutralization also influences the degree of intent to participate. However, how a positive view about neutralization will affect intent to participate depends on the number of activist groups in the community. For individuals residing in communities with 3 or fewer activist groups, a positive view about neutralization tends to be related to a higher intent to participate. The fewer activist groups, the more a positive view about neutralization is related to higher levels of intent to participate. However, for residents in communities with 4 or more activist groups, a positive view about neutralization is associated with lower intent to participate.

Both Incineration Score (INCINSUM) and Neutralization Score (NEUTRSUM) were centered on their respective grand means (i.e., grand mean, not site mean). N\_GROUPS, however, was not centered. To apply these Equations 6

and 7, use the deviation scores of Incineration Score (INCINSUM) and Neutralization Score (NEUTRSUM) and the raw score of N\_GROUPS. To facilitate this application, Table 7.1 shows the grand mean and standard deviations of these variables.

**Table 7.1: Mean and standard deviation of predictor variables in Equation 6**

		N	Mean	Standard Deviation
Variable	INCINSUM	2539	4.604	2.745
	NEUTRSUM	2539	3.808	2.619

The intercept for each of the following equations represents the expected Participation Intent (DESCSUM) score of a typical subject whose Incineration Score (INCINSUM) and Neutralization (NEUTRSUM) scores equal their respective grand means.

For a community *with no activist groups at all*, the best prediction of Participation Intent Score (DESCSUM) is:

$$\text{Predicted DESCsum} = 4.845 + 0.121(\text{INCINSUM}) + 0.103(\text{NEUTRSUM}) \quad (8)$$

For a community with X activist groups, the best prediction of Participation Intent Score (DESCSUM) is:

$$\text{Predicted Participation Intent Score (DESCsum)} = 4.845 + 0.121(\text{INCINSUM}) + (0.103 - 0.027X)(\text{NEUTRSUM}). \quad (9)$$

The number of known activist groups in each of the eight sites used in this study is shown in Table 7.2.

**Table 7.2: Number of Activist Groups in each of the 8 sites**

		Activist Groups
Site	Anniston	4
	Blue Grass	2
	Edgewood	3
	Newport	1
	Pine Bluff	3
	Pueblo	1
	Tooele	4
	Umatilla	3



Applying the values in Table 7.2 to Equation 9, the best prediction equation for Participation Intent Score (DESCSUM) for each of the 8 sites used in this study is as follows:

For <i>Anniston</i> : Predicted Participation Intent Score (DESCSUM) = $4.845 + 0.121(\text{INCINSUM}) - 0.005(\text{NEUTRSUM})$
For <i>Bluegrass</i> : Predicted Participation Intent Score (DESCSUM) = $4.845 + 0.121(\text{INCINSUM}) + 0.049(\text{NEUTRSUM})$
For <i>Edgewood</i> : Predicted Participation Intent Score (DESCSUM) = $4.845 + 0.121(\text{INCINSUM}) + 0.022(\text{NEUTRSUM})$
For <i>Newport</i> : Predicted Participation Intent Score (DESCSUM) = $4.845 + 0.121(\text{INCINSUM}) + 0.076(\text{NEUTRSUM})$
For <i>Pine Bluff</i> : Predicted Participation Intent Score (DESCSUM) = $4.845 + 0.121(\text{INCINSUM}) + 0.022(\text{NEUTRSUM})$
For <i>Pueblo</i> : Predicted Participation Intent Score (DESCSUM) = $4.845 + 0.121(\text{INCINSUM}) + 0.076(\text{NEUTRSUM})$
For <i>Tooele</i> : Predicted Participation Intent Score (DESCSUM) = $4.845 + 0.121(\text{INCINSUM}) - 0.005(\text{NEUTRSUM})$
For <i>Umatilla</i> : Predicted Participation Intent Score (DESCSUM) = $4.845 + 0.121(\text{INCINSUM}) + 0.022(\text{NEUTRSUM})$

## Discussion

This study addressed the following three research questions: (1) To what extent do respondents *participate* in specific civic activities, and to what extent do respondents *intend* to participate in site-related decisions? (2) To what extent do psychological, social, economic, and programmatic factors influence a respondent's *civic participation* or *personal intent* to participate? (3) To what extent is a respondent's *civic participation* or *personal intent* to participate individually or contextually determined? Several strong inferences can be made from the findings of this study with respect to each of these three questions.

*To what extent do respondents participate in specific civic activities, and to what extent do respondents intend to participate in site-related decisions?* Irrespective of the context, government agencies often assert that the public is apathetic and unwilling to participate (Grant, 1994). Are such assertions supported by the findings of this study? In general, residents in this sample demonstrated relatively high levels of civic participation and they appeared willing to participate in site-related decisions. In terms of civic participation, these residents reported participating in more civic activities than did residents living near other hazardous waste facilities that have been studied. On average, residents in the sample participated in 2.5 civic activities within the past year. In a recent study, the average civic participation among residents living near a DOE Nuclear Weapons facility was found to be only 1.9 activities within the past *two* years (Brown and Williams, 1998). Approximately 30.6% of the residents in this sample reported having participated in 3-5 civic activities within the past year. Reported participation was much lower in two separate studies of New Jersey residents living near hazardous waste facilities. Only 17.7% of residents in one study and 24.3% in the other reported participating in 3-5 specific activities within the past *two* years (Greenberg and Schneider, 1994; Greenberg and Schneider, 1996; Greenberg and Schneider, 1997). As evidenced by these

comparisons, residents living near chemical stockpile sites do not appear to demonstrate a reluctance to participate in general.

*To what extent do psychological, social, economic, and programmatic factors influence a respondent's civic participation or personal intent to participate?* The determinants of civic participation among this sample have nothing to do with site-related issues. In fact, civic participation among this sample was driven essentially by personal factors. Participation in civic activities was influenced by one's educational attainment and family size. Residents who have a college education and a large family demonstrated higher levels of civic participation than residents without a college degree and smaller families. The literature substantiates the assertion that well educated individuals tend to understand the necessity for and value civic involvement (Feldman and Hanahan, 1996). Intuitively, it makes sense that having a large family might require a great deal of civic participation given the variety of civic related activities in which children often participate.

The majority of these residents also indicated they want and intend to participate in site-related decisions. Most residents indicated they *want* to participate in site-related decisions (65.4%) but did not *know how* to participate (57.5%). However, other information obtained from the survey suggests that the knowing how to participate may not predict actual participation. Approximately 58% of respondents indicated they were "aware that there is a local outreach office that can answer their questions" as opposed to 37% who indicated they were not aware. Evidently, the majority of residents do know how to get information about the program. Nevertheless, respondents showed little initiative when given an actual opportunity at the end of the survey to take down the telephone number for their local outreach office. Only 49.4% of respondents chose to do so. Of those who actually took the number, approximately less than 1% (.85%) actually called their local outreach office. Overall, only 35 out of the 8,315 respondents actually took the initiative to make an inquiry. These findings suggest that residents are exaggerating their desire or intent to become involved. Overreporting of "socially" desirable behaviors such as civic participation is quite common (Edwards, 1957).

There is substantial evidence in the literature that suggests that "behaviors" such as civic participation can not be explained by "behavioral intent" alone (Glanz, Lewis, and Rimer, 1990). More research is needed to examine the relationship between the intent to participate and various forms of participation. It is plausible that "intent" may be more useful in predicting "reactive" rather than "proactive" public participation. That is, does the intent to participate explain public reactions to acute events that occurred at a hazardous waste facility? As discussed earlier, the literature suggests one's personal intent to become involved is bolstered by the occurrence of an acute event (i.e., accidental spills, loss of jobs, etc.) at a hazardous waste facility (Reagan and Fedor-Thurman, 1987). Personal intent is likely "strengthened" because the event is more salient in one's mind. Consequently, intent is readily translated into a personal reaction to the event (i.e., attending a public protest, writing an editorial letter, etc.). More research is needed to understand the actual impact of personal intent on public involvement. Nonetheless, the findings of this study suggest that one's intent to participate is influenced by both individual and community level factors.

A resident's intent to participate was influenced by his or her perceptions toward public outreach, perceptions of risk associated with the site, perceptions toward disposal technologies, perceptions of site impact on community, and educational attainment. Contrary to the literature, in this instance few of the correlates of personal intent are derived from negative associations with the site. Most participation appears to arise from positive beliefs about the site. The perceived impact of the site on one's community influenced the intent to participate. A resident intended to become more involved if he or she believed that the site has a positive impact on his or her community. Typically, residents are more likely to get involved if they believe a hazardous waste facility has had a negative impact on their community (Reagan and Fedor-Thurman, 1987). Personal factors such as being college educated and being male were also associated with increased personal intent. This too is somewhat contrary to the literature that suggests that females demonstrate a greater tendency to participate in civic activities (Feldman and Hanahan, 1996). Being aware of and valuing public outreach activities was also positively associated with personal intent. This gives some indication that public outreach has the potential to directly increase public participation.

The perceived efficacy of disposal technologies influenced personal intent. The attribution of desirable characteristics with either incineration or neutralization disposal technologies was also positively correlated with personal intent. A resident was more intent on participating if he or she believed that either incineration or neutralization was more efficacious. Perhaps, the belief in one technology versus the other motivates individuals to protect their invested interest by taking some sort of participatory action. More research is necessary to substantiate such an assertion. However, technological attributions alone are insufficient predictors of personal intent. The findings of this study indicate that community level factors may actually mediate with respect to technological attributions.

Residents' perceptions of risk represented the sole negative correlate of personal intent. A resident intended to become more involved if he or she believed that the site posed a personal risk. This is consistent with the literature. Several studies have indicated that these negative attributions (e.g., heightened risk perception) strongly influence public participation, particularly public opposition. Subsequent analyses will examine the determinants of risk perception among these residents.

*To what extent is a respondent's civic participation or personal intent to participate individually or contextually determined?* In this context, the intent to participate is a function of how much a person associates both positive and negative characteristics with the site. However, factors present within the community in which one resides also influenced personal intent. The presence of activists groups in community influenced residents' intent to participate. Results of this study show that the presence of activist groups in the community has no direct influence over residents' intent to participate. Had the presence of activist groups had a direct influence on intent to participate, the number of activist groups would have surfaced as a significant predictor of the level-1 intercept. Instead, it was a significant predictor of regression slope for perceptions toward the neutralization technology. However, the presence of activist groups did have an *indirect* influence on residents' intent to participate. Specifically, how a person's view regarding neutralization method may affect the person's intent to participate is a function of the number of activist

groups in the community. As the number of activist groups increased in a community, the less impact that perception toward neutralization had on residents' willingness and ability to participate. Consequently, for a given level of fixed acceptance of neutralization, the presence of a high number of activist groups in a community tended to indirectly *decrease* the personal intent to participate. Conversely, for a given level of fixed acceptance toward incineration, the number of activist groups will neither increase nor decrease the effect of the perception on the intent to participate.

The observed influence of activist groups on these local communities is interesting. The conventional wisdom among many government officials is that activist groups provide the primary catalyst for public participation, especially public opposition. Some findings have supported this supposition (Fortmann, 1988). In fact, these findings suggest quite the opposite. It is plausible that the increased presence of activist groups in a community actually hinders rather than facilitates public participation. In this case, it appears that residents who live in a community with a large number of such groups are less inclined to attribute favorable characteristics toward neutralization. Residents living in a community with three or more activist groups were less inclined to participate, possibly because their feelings about neutralization are more moderate. In contrast, those living in a community with three or less activist groups demonstrated the opposite tendency.

The observed influence of technology perceptions on participatory intent is somewhat predictable. Neutralization represents a more "novel" disposal technology that was largely developed as an "alternative" to incineration technology. Additionally, some activist groups assert that neutralization is a "safer" technology. Differences in opinion regarding the efficacy of the two technologies and possibly others has led to dissension and civic action among at least a segment of the population surrounding these sites. Hence, it is not surprising that once the public is less polarized with respect to disposal technologies, that their desire to participate is diminished. However, it is surprising that these activist groups are somehow associated with lessening the impact of the public's views on neutralization, given that these groups are largely unsupportive of incineration and supportive of alternative technologies.

Despite the observed relationship between activist groups and public participation, several issues warrant further research. Is the public inclined to let activist groups speak and act on their behalf? Does the public feel less qualified than activist groups to make technical decisions? In general, how are activist groups perceived by the public? Is the public discouraged by the often public squabbling between government agencies and activist groups? Is it ethical to only allow activist groups to speak on the behalf of the public? These questions are largely unanswered in the literature. Additional research is necessary to answer these questions. Future studies should examine the exact nature of the relationship between the general public and activist groups.

Contrary to popular belief, residents' level of trust of the Army did not significantly influence either their civic participation or personal intent. Other studies have suggested that institutional distrust often provides a strong catalyst for public opposition. However, the public does not appear to strongly distrust the Army. Only about 17% of respondents indicated that they distrusted the Army when it comes to disposing of chemical weapons safely. Hence,

it is logical that public trust in this context did not significantly impact participation. However, this is significant in that institutions such as the Army often operate under the assumption that they are the victims of widespread distrust. Subsequent reports will examine the complex nature of trust among these residents.

Overall, the findings from this study provide some parameters for defining public involvement. This provides at least some tangible criteria from which to begin evaluating the efficacy of specific outreach initiatives. Residents in this sample have helped self-define public involvement in the following three general categories: *type* of civic involvement, *intent* to become involved, and the perceived *level of comfort* with site-related decisions and decision-makers. First, given the reported proclivities toward specific *types* of public participation, it is now possible to tailor public outreach to include the kinds of preferred activities that will most likely increase public participation. Secondly, the findings from this study point out the factors that influence one's *intent* to participate. Perhaps, the most important correlate of personal intent is the awareness and perceived value of public outreach. Given that awareness of public outreach programs was positively related to personal intent, it is reasonable to suggest that such programs can actually influence public participation. Increasing the public visibility and breadth of outreach activities may enhance a given program's ability to foster participation among its clients.

Finally, the *public's perceived level of comfort* furnishes yet another element of public involvement. Public discomfort with potential risks posed by the site or with a given disposal technology tended to increase the public's intent to become involved. In contrast, public trust in the Army as a decision-maker did not significantly affect such intent. Although much effort has gone into educating the public about risks and providing them with opportunities to assist in the decisions surrounding the use of specific disposal technologies, some discomfort with these issue still remains.

This discomfort does not appear to be a direct function of distrust in the Army. Respondents are confident in the Army's ability to operate safely -- less than 20% indicated otherwise. However, residents still perceive a relatively high level of risk. Where then is public confidence concerning personal safety lacking? Like many other groups, the Army lacks the authority and ability to control all potential risks posed by the presence of hazardous substances. The public is seldom aware that another agency holds this responsibility. Therefore, it holds the most identifiable group, the Army, responsible for reducing such risks. For example, about 57% of respondents indicated they did not know what to do in case of a chemical emergency. Given that the Army does not have direct control over emergency preparedness, how can it convince the public that it will protect them from risks posed by a chemical emergency? If the public is not cognizant of the various responsibilities of each group, then their participation may be misplaced and they are then likely to expend energy in commenting on the practices of groups that have no direct relevance to their cause.

Although this study provides some insight into public participation, there is obviously much more to be learned. In order to achieve a better understanding, public involvement must be examined over time and using more detailed metrics. In light of the rapidly changing nature of the chemical demilitarization program, it is important to evaluate public involvement temporally in relation to specific changes in program decisions and activities. Additionally,

given the broad nature of this entire study it was not feasible to measure public involvement in the kind of detail necessary to answer some of the complex questions posed in this discussion. For example, the relationship between activist groups and participation is particularly intriguing. The mechanisms by which activist groups may actually influence public participation should be investigated further. Additionally, future studies should examine the effects of individual and community level factors on the actual participation in specific site activities. As sites increasingly document such participation, it will become more feasible to conduct such an investigation.

## References

1. Arnold, C. L. (1992). An introduction to hierarchical linear models. *Measurement and Evaluation in Counseling and Development*, 25, 59-90.
2. Baker, R. (1996). Nobody's talking. The method isn't the issue. Response rates are down period. *Marketing Research*, 8(1), 22-24.
3. Binny, S. E., Mason, R., Martsolf, S., & Detweiler, J. H. (1996). Credibility, public trust, and the transport of radioactive waste through local communities. *Environment and Behavior*, 28, 283-302.
4. Bord, R. J. & O'Connor, R. E. (1992). Determinants of risk perceptions of a hazardous waste site. *Risk Analysis*, 12(3), 411-416.
5. Brown, S. & Williams, B. (1998). *Determinants of Public Involvement Among Residents Living Near the Savannah River Site*. Presented at the annual meeting of the Society for Risk Analysis. Phoenix, AZ.
6. Carnes, S. A, Schweitzer, M., Peelle, E. B., Wolfe, A.K., & Munro, J.F. (1998). Measuring the success of public participation on environmental restoration and waste management activities in the US Department of Energy. *Technology in Society*, 20(4), 385-406.
7. Cohen, N. (1995). Technical assistance for citizen participation: A case study of New York City's environmental planning process. *American Review of Public Administration*, 25(2), 119-135.
8. Davis, C. (1986). Public involvement in hazardous waste siting decisions. *Polity*, 19(2), 296-304.
9. Davis, J. A. & Smith, T. W. (1992). *The NORC General Social Survey: A User's Guide*. Newsbury Park: Sage.
10. Desario, J. & Langton, S. (1987). Citizen participation and technocracy. *Citizen Participation in Public Decision Making*. Westport, CT: Greenwood Press.
11. Dunlap, R. E. (1991). Trends in public opinion toward environmental issues. *Society and Natural Resources*, 4(3), 285-312.
12. Edwards, A. (1957). *The social desirability variable in personality assessment and research*. New York: Dryden.
13. Feldman, D. L. & Hanahan, Ruth A. (1996). Public perceptions of a radioactively contaminated site: Concerns, remediation preferences, and desired involvement. *Environmental Health Perspectives*, 104, 1344-1352.
14. Feldman, D. L., Hanahan, R. A., & Perhac, R. (1999). Environmental priority-setting through comparative risk assessment. *Environmental Management*, 23(4), 483-493.
15. Flynn, J., Kasperson, R., Kunreuther, H., & Slovic, P. (1997). Redirecting the U.S. high-level nuclear waste program. *Environment*, 39, 7-30.
16. Fortmann, L. (1988). Predicting natural resources micro-protest. *Rural Sociology*, 53(3), 357-367.
17. Gittell, M. (1983). The consequences of mandating citizen participation. *Policy Studies Review*, 3(1), 90-95.
18. Glanz, K., Lewis, F. M. & Rimer, B. K. (1990). *Health Behavior and Health Education*. San Francisco, CA: Jossey-Bass.
19. Glicken, J. (1999). Effective public involvement in public decisions. *Science Communication*, 20(3), 298-327.

20. Grant, J. (1994). *The drama of democracy: Contention and dispute in community planning*. Toronto: University of Toronto Press.
21. Greenberg, M. & Schneider, D. (1994). Hazardous waste site recommendation, neighborhood change, and neighborhood quality. *Environmental Health Perspectives*, 102, 542-547.
22. Greenberg, M., & Schneider, D. (1996). *Environmentally devastated neighborhoods: Perceptions, realities, and policies*. New Brunswick, NJ: Rutgers University Press.
23. Greenberg, M. & Schneider, D. (1997). Neighborhood quality, environmental hazards, personality traits, and resident actions. *Risk Analysis*, 17(2), 169-175.
24. Greenberg, M. & Schneider, D., & Choi, D. (1994). Neighborhood quality. *The Geographical review*, 84(1), 1-15.
25. Hox, J. J. & de Leeuw, E. D. (1994). A comparison of nonresponse in mail, telephone, and face-to-face surveys. *Quality & Quantity*, 28, 329-344.
26. Kaplan, S. & Kaplan, R. (1989). The visual environment: Public participation in design and planning. *Journal of Social Issues*, 45(1), 59-86.
27. Kemp, R. (1990). Why not in my backyard? A radical interpretation of public opposition to the deep disposal of radioactive waste in the United Kingdom. *Environment and Planning*, 22, 1239-1258.
28. Kristal, A. R., White, E., Davis, J. R., Corycell, G., Raghunathan, T., Kinne, S., & Lin, T. K. (1993). Effects of enhanced calling efforts on response rates, estimates of health behavior, and costs in a telephone health survey using random-digit dialing. *Public Health Reports*, 108(3), 372-379.
29. Kweit, R. W. & Kweit, M. G. (1980). Bureaucratic decision making: Impediments to citizen participation. *Polity*, 12, 647-666.
30. Kweit, M. G. & Kweit, R. W. (1987). The politics of policy analysis: The role of citizen participation in analytic decision making. In J. De Sario & S. Langton, *Citizen participation in public decision making*. New York: Greenwood Press.
31. Lidskog, R. (1997). From conflict to communication? Public participation and critical communication as a solution to siting conflicts in planning for hazardous waste. *Planning Practice & Research*, 12(3), 239+.
32. Luevano, P. (1994). *Response rates in the national election studies*. Technical Report No. 44, National Elections Studies.
33. Merkhofer, M. W., Conway, R. & Anderson, R. G. (1997). Multiattribute utility analysis as a framework for public participation in siting a hazardous waste management facility. *Environmental Management*, 21(6), 831-839.
34. Newton, D. E. (1996). *Environmental Justice*. Santa Barbara, CA: ABC-CLIO, Inc.
35. Oldendick, R. W. & Link, M. W. (1994). The answering machine generation. Who are they and what problem do they pose for survey research? *Public Opinion Quarterly*, 58, 264-273.
36. Oldendick, R. W., Bishop, G. F., Sorenson, S. B., & Tuchfarberber, A. J. (1988). A comparison of the Kish and last birthday methods of respondent selection in telephone surveys. *Journal of Official Statistics*, 4, 307-318.
37. O'Rourke, D. & Blair, J. (1983). Improving random respondent selection in telephone surveys. *Journal of Marketing Research*, 20, 428-432.



38. Perhac Jr., R. M. (SPR 1998). Comparative risk assessment: Where does the public fit in? *Science, Technology and Human Values*, 23(2), 221-241.
39. Petts, J. (1995). Waste management strategy development: A case study of community involvement and consensus building in Hampshire. *Journal of Environmental Planning & Management*, 38(4), 519+.
40. Petts, J. (1997). The public-expert interface in local management decisions: Expertise, credibility and process. *Public Understanding Science*, 6, 359-381.
41. Pontius, F. W. (1998). Shaping regulations through public involvement opportunities. *Journal American Water Works Association*, 90(1), 20+.
42. Reagan, M. D. & Fedor-Thurman, V. L. (1987). Public participation: Reflections on the California energy policy experience. *Citizen Participation in Public Decision Making*. Westport, CT: Greenwood Press.
43. Reagan, J., Pinkleton, B., Aaronson, D. & Ramo, E. (1995). Differentiating telephone surveys from telemarketing to increase response rates. *Communication Research Reports*, 12 (2), 170-177.
44. Salter, R. (1999). *Statement for the Record of Russell Salter, Director, Chemical and Radiological Preparedness Division, Federal Emergency Management Agency before the Subcommittee on Government Management, Information and Technology of the Committee on Government Reform U.S. House of Representatives August 16, 1999.*
45. Schmidley, A. D. (1986). How to overcome bias in telephone survey. *American Demographics*, 8, 50-54.
46. Shepherd, A. & Bowler, C. (1997). Providing balanced risk information in surveys used as citizen participation mechanisms. *Society & Natural Resources*, 40(6), 107+.
47. Smith, T. W. (1995). Trends in non-response rates. *International Journal of Public Opinion Research*, 7(2), 157-171.
48. Sokolowska, J. & Tyszka, T. (1995). Perception and acceptance of technological environmental risks: Why are poor countries less concerned? *Risk Analysis*, 15(6), 733-743.
49. The Presidential/ Congressional Commission on Risk Assessment and Risk Management. (1997). *Framework for environmental health risk management*. Final Report. Vol 1.
50. U.S. Bureau of the Census. (Internet Release Date: March 12, 1999). County Population Estimates and Demographic Components of Population Change: Annual Time Series, July 1, 1990 to July 1, 1998. <http://www.census.gov>
51. Whitlark, D. & Geurts, M. (1998). Phone surveys. How well do respondents represent average Americans? *Marketing Research*, 10(3), 13-17.
52. Williams, B. L., Brown, S. & Greenberg, M. (1999). Determinants of trust perceptions among residents surrounding the Savannah River nuclear weapons site. *Environment and Behavior*, 31(3), 354-371.

## Appendix A

### Final Survey Objectives by Rank

OBJECTIVES	
1.	Perceived community health risks associated with the use of potential, proposed, or existing technology used for disposal of chemical agent in community.
2.	The extent to which the public is familiar with a site's existence, location, stockpiled chemical agent, and storage and/or disposal activities or plans.
3.	Public's understanding of potential, proposed or existing technology used for disposal of chemical agent at local site.
4.	Public understanding and practice of emergency response procedures among residents living in Emergency Response Zones.
5.	Perceived community health risks (to the public and on-site personnel) associated with storage of chemical agent in community.
6.	Degree of public acceptance (e.g., reasons for acceptance or lack of acceptance) of potential, proposed or existing technology used for disposal of chemical agent at local site.
7.	The extent to which the public trusts the Army to look out for the public's general welfare (e.g., providing truthful and timely information).
8.	The extent to which the public trusts the Army and related contractors to achieve the goals of the Chemical Demilitarization Program.
9.	Degree of public trust in all those who oversee the Chemical Demilitarization Program including federal And state regulators and independent oversight groups (e.g., National Research Council).
10.	Public's intention to participate in program decision-making process and the public's perceived barriers to and benefits of such participation.
11.	Perceptions toward the site's overall impact on the local environment.
12.	Perceived impact of and awareness of outreach activities (e.g., information and involvement activities) undertaken at local site.
13.	The extent to which the public believes the site has positively or negatively influenced their local community (i.e., economic impact, impact on community image, etc.).
14.	Utilization of and perceptions toward communication sources (i.e., media) among residents living near site.
15.	Public awareness of the non-stockpile chemical materiel program scope, responsibilities, local material location, and any local issues pertaining to the non-stockpile chemical materiel program. (e.g., buried/recovered chemical warfare materiel).
16.	Perceptions toward the future use of on-site land for other purposes (e.g., industry, recreation, etc.).

## **Appendix B**

### **Chemical Demilitarization Stakeholder Instrument**

Chemical  
Demilitarization  
Stakeholder  
Instrument

*Global Version*

Prepared and field-tested by:  
Environment, Behavior, and Risk Research Lab

THE UNIVERSITY OF ARIZONA®  
TUCSON ARIZONA

First I will read you a list of statements about emergency preparedness.

We would like to know the extent to which you agree or disagree with each statement.

Please tell me whether you “**Agree**”, “**Disagree**”, or are “**Have no strong feelings either way**” concerning the following statements.

(EXPAND) IF “DISAGREE” > ASK: “Do you *strongly disagree* OR do you *disagree somewhat*?”  
IF “AGREE” > ASK: “Do you *strongly agree* OR do you *agree somewhat*?”

Emergency Preparedness (Global)	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Don't Know
1. I know exactly what to do if I am warned of a chemical emergency.	①	②	③	④	⑤	⑥
2. Emergency personnel are well prepared to handle a chemical emergency at the site.	①	②	③	④	⑤	⑥
3. I trust emergency personnel to tell us what to do in case of a chemical emergency.	①	②	③	④	⑤	⑥
4. The Army takes careful measure to make sure that a chemical emergency would not affect our community.	①	②	③	④	⑤	⑥

Emergency Preparedness (Version A)	①	②	③	④	⑤	⑥
5. I know where the evacuation routes are located for my community.	①	②	③	④	⑤	⑥
6. I know exactly how I will be informed of a chemical emergency.	①	②	③	④	⑤	⑥
7. I understand what the words “shelter in place” mean.	①	②	③	④	⑤	⑥

Emergency Preparedness (Version B)	①	②	③	④	⑤	⑥
8. I can hear warning signals from the site when I am outside.	①	②	③	④	⑤	⑥
9. I use an indoor chemical warning system such as a tone-alert radio.	①	②	③	④	⑤	⑥
10. I need an indoor chemical emergency warning system.	①	②	③	④	⑤	⑥
11. Overall, the warning signals work very well.	①	②	③	④	⑤	⑥

I will now read you a list of statements you may or may not do in the event of a chemical emergency.

Please tell me whether or not you think you take the specified action.

<b>Actions (Version A)</b>			
	Should Do	Should Not Do	Don't know
12. Immediately leave town	①	②	⑥
13. Call emergency response personnel and ask what to do	①	②	⑥
14. Wait for additional warnings before doing anything	①	②	⑥

<b>Actions (Version B)</b>			
15. Call local police station	①	②	⑥
16. Go inside your home or another building	①	②	⑥
17. Listen to radio for further directions	①	②	⑥
18. Go to the nearest hospital or clinic	①	②	⑥

Now I am going to read you some general statements about chemical weapons disposal technologies and chemical agents.

Please tell me if you think these statements are “**Accurate**” or “**Inaccurate**”.

<b>General Statements (Version A)</b>	<b>Accurate</b>	<b>Inaccurate</b>	<b>Don't Know</b>
19. There are ways of disposing of chemical weapons that pose absolutely no risk to the public.	①	②	⑥
20. Scientists know a lot more about incineration than they do about neutralization.	①	②	⑥
21. Incineration is the only disposal technique that produces by-products that require additional disposal.	①	②	⑥
22. Scientists are currently testing other methods for disposing of chemical weapons.	①	②	⑥
23. There are ways to dispose of chemical weapons without producing potentially harmful by-products.	①	②	⑥
24. It takes longer to start the incineration process than it does the neutralization process.	①	②	⑥

<b>General Statements (Version B)</b>			
25. The by-products from incineration are more harmful than the by-products from neutralization.	①	②	⑥
26. Your local site, _____, stores Nerve Agent in bulk containers.	①	②	⑥
27. Your local site, _____, stores Blister Agent in weapon form.	①	②	⑥
28. Your local site, _____, stores Nuclear weapons.	①	②	⑥
29. Chemical weapons are being incinerated at your local site.	①	②	⑥
30. A long time ago, the Army tested and disposed of chemical weapons on land outside your site.	①	②	⑥

<b>General Statements (Version C)</b>			
31. There is federal law saying that chemical weapons must be destroyed.	①	②	⑥
32. Your local site, _____, stores Blister Agent in bulk containers.	①	②	⑥
33. Your local site, _____, stores Nerve Agent in weapon form.	①	②	⑥
34. Your local site, _____, stores Biological weapons.	①	②	⑥
35. Chemical weapons are being neutralized at your local site.	①	②	⑥
36. All chemical weapons are located on site and cannot be found elsewhere.	①	②	⑥

I will now read you a list of activities related to the chemical stockpile.

We would like to know how likely you think these activities would be harmful to you or your family’s health if they were done at the site.

Do you think there is **NO CHANCE**, a **SMALL CHANCE**, a **FAIR CHANCE**, a **GOOD CHANCE**, or a **CERTAIN CHANCE** that this would be harmful to you or your family’s health?

Risk Perception (Version B)					
	No Chance	Small Chance	Fair Chance	Good Chance	Certain Chance
37. Being down wind of the site.	①	②	③	④	⑤
38. Eating local produce.	①	②	③	④	⑤
39. Drinking from local water sources.	①	②	③	④	⑤
40. Coming into contact with soil near the site.	①	②	③	④	⑤
41. Eating food such as fish or venison from near the site.	①	②	③	④	⑤
42. Periodic vapor leaks on site grounds.	①	②	③	④	⑤

Risk Perception (Version C)					
43. Storage of chemical weapons.	①	②	③	④	⑤
44. Incineration of chemical weapons.	①	②	③	④	⑤
45. Neutralization of chemical weapons.	①	②	③	④	⑤
46. Transport of chemical weapons.	①	②	③	④	⑤
47. Living less than 5 miles from the site.	①	②	③	④	⑤
48. An accidental release of chemical weapons on site grounds.	①	②	③	④	⑤
49. Working at the site.	①	②	③	④	⑤



My next set of questions is about programs designed to better inform the public about chemical disposal.

We would like to know the extent to which you agree or disagree with each statement.

Please tell me whether you “**Agree**”, “**Disagree**”, or are “**Have no strong feelings either way**” concerning the following statements.

(EXPAND) IF “DISAGREE” > ASK: “Do you *strongly disagree* OR do you *disagree somewhat*?”  
IF “AGREE” > ASK: “Do you *strongly agree* OR do you *agree somewhat*?”

Outreach Awareness (Global)	Strongly Disagree	Disagree Somewhat	Neutral	Agree	Strongly Agree	Don't Know
50. People in my community have been adequately informed about decisions made at our local site.	①	②	③	④	⑤	⑥
51. I know where to get information concerning various activities undertaken at our local site.	①	②	③	④	⑤	⑥
52. I am aware that there is a local outreach office that can answer my questions concerning chemical disposal at the site.	①	②	③	④	⑤	⑥
53. The local outreach office has helped local citizens understand various issues surrounding chemical disposal at the site.	①	②	③	④	⑤	⑥
54. The local outreach office staff is well prepared to answer people's questions about chemical disposal at the site.	①	②	③	④	⑤	⑥
55. Informing our community about the disposal of chemical weapons is an important public service.	①	②	③	④	⑤	⑥
56. The media has strongly influenced my personal opinion about the site.	①	②	③	④	⑤	⑥
57. The local outreach office keeps our community well informed concerning activities at the site.	①	②	③	④	⑤	⑥

Now I will read you some questions about the extent to which you trust the army.

Please tell me how much you trust or distrust the army to each of the following

Please tell me whether you “**Trust**”, “**Distrust**”, or “**Neither Trust nor Distrust**” the Army to do the following:

(EXPAND) IF “TRUST” > ASK: “Do you *mostly trust* OR do you *completely trust*?”  
IF “DISTRUST” > ASK: “Do you *mostly distrust* OR do you *completely distrust*?”

Trust of Army Activities (Global)	Completely Distrust	Mostly Distrust	Neither Trust Nor Distrust	Mostly Trust	Completely Trust	Don't Know
58. Store chemical weapons <i>safely</i> .	①	②	③	④	⑤	⑥
59. Dispose of chemical weapons <i>safely</i> .	①	②	③	④	⑤	⑥
60. Dispose of chemical weapons <i>quickly</i> .	①	②	③	④	⑤	⑥
61. Comply with government regulations that protect the public.	①	②	③	④	⑤	⑥
62. Keep our community <i>well informed</i> .	①	②	③	④	⑤	⑥
63. Protect the health of our community's residents.	①	②	③	④	⑤	⑥
64. Answer our community's questions <i>honestly</i> .	①	②	③	④	⑤	⑥
65. Respond to scientific studies (i.e., risk assessments).	①	②	③	④	⑤	⑥
66. Respond to our community's concerns about chemical weapons disposal.	①	②	③	④	⑤	⑥

My next set of questions is about the different ways of disposing of chemical weapons, **Neutralization** and **Incineration**. These methods can be simply defined in the following way:

**Neutralization** is the controlled use of water and chemicals to break-down chemical agents.

**Incineration** is the controlled burning of chemical weapons.

Use these basic definitions and what you already know about these disposal methods to answer each of the following questions.

Please tell me if you think the following phrases describe **Incineration**, **Neutralization**, **Both** Incineration AND Neutralization, or **Neither** Incineration NOR Neutralization. If you don't know about a method, we would like to know that, also.

Disposal Method	Incineration	Neutralization	Both	Neither	Don't Know
Characteristics (Versions A & B)					
67. Easy to understand.	①	②	③	④	⑤
68. Cost-effective.	①	②	③	④	⑤
69. Reversible ( <i>not permanent, can be stopped and replaced with another disposal method if it does not work properly</i> ).	①	②	③	④	⑤
70. Beneficial to our local economy.	①	②	③	④	⑤
71. The best way to dispose of chemical weapons.	①	②	③	④	⑤
72. Better than long-term storage of chemical weapons.	①	②	③	④	⑤
73. Favored by most people in my community.	①	②	③	④	⑤
74. A process that is being used by other sites.	①	②	③	④	⑤
75. The least risky way to dispose of chemical weapons.	①	②	③	④	⑤
76. A flexible process ( <i>can be tested in parts before being put into full use</i> ).	①	②	③	④	⑤
77. The fastest way to dispose of chemical weapons	①	②	③	④	⑤

Now I would like to ask you a question about your site and its effect on your community.

78. Overall, Do you think the site has had a positive or negative effect on you community? **(GLOBAL)**

1. Positive Effect
2. Negative Effect
3. Neither positive nor negative
4. Don't know

Next I will ask you more specific questions about how you feel your site has affected your community

In your opinion, has your local site IMPROVED, WORSENER, or has it HAD NO EFFECT on this aspect of your community?

<b>Community Effects (Version C)</b>	<b>Improved</b>	<b>Worsened</b>	<b>Had no effect</b>	<b>Don't know</b>
79. The health of community residents.	①	②	③	⑥
80. The community environment.	①	②	③	⑥
81. The local economy (i.e. jobs).	①	②	③	⑥
82. The community's image.	①	②	③	⑥
83. The community's property values.	①	②	③	⑥

I am now going to read you a list of activities. Please tell me whether of not you have done any of these within the *past year*.

<b>Participation (Versions A &amp; C)</b>	<b>Did Activity</b>	<b>Did Not do Activity</b>	<b>Don't Know</b>
84. Attended a public meeting	①	②	⑥
85. Contacted an elected official	①	②	⑥
86. Called the police for any reason	①	②	⑥
87. Volunteered for a civic or church function	①	②	⑥
88. Organized a neighborhood function	①	②	⑥
89. Wrote a letter to the newspaper editor	①	②	⑥
90. Signed a petition	①	②	⑥
91. Participated in a public protest	①	②	⑥
92. Participated in labor union activities	①	②	⑥

I am now going to read you some terms that might describe the army's handling of chemical weapons disposal.

Please tell me to what extent you think the statement describes the army.

<b>TERMS (Versions A &amp; C)</b>	<b>A Perfect Description of the Army</b>	<b>A Good Description of the Army</b>	<b>A Fair Description of the Army</b>	<b>A Poor Description of the Army</b>	<b>Does not Describe the Army at All</b>	<b><i>Don't Know</i></b>
93. Trustworthy	①	②	③	④	⑤	⑥
94. Competent	①	②	③	④	⑤	⑥
95. Cost conscious	①	②	③	④	⑤	⑥
96. Responsible	①	②	③	④	⑤	⑥
97. Responsive to public concerns	①	②	③	④	⑤	⑥
98. Safety conscious	①	②	③	④	⑤	⑥

99. Now . . . we would like to know how you would like to be informed about chemical weapons disposal activities.

*Specifically*, what would be the *best* way to keep you up-to-date about chemical weapons disposal activities? (Choose One – No Prompt)

☐ **Newspapers:** (e.g., newspaper articles, announcements & advertisements, etc.)  
\_\_\_\_\_ (specify paper)

☐ **Other Written Media:** (e.g., magazines, direct mailings, pamphlets, books).  
\_\_\_\_\_ (specify media)

☐ **Television:** (e.g., public service announcements, cable access/public television channel, news, etc.)  
\_\_\_\_\_ (specify channel)

☐ **Radio:** (e.g., public & commercial)  
\_\_\_\_\_ (specify station)

☐ **Employer:** (e.g., company newsletter, union meetings, employee wellness/health program, etc.)

☐ **Contact with Professionals:** (e.g., Physicians or Doctors, Scientists, Teachers or Principals, Lawyers, etc.)

☐ **Personal Contacts:** (e.g., friends, family, peers, etc.)

☐ **Community Spokespersons:**  
(visible people speaking in behalf of the community)

☐ **Government Agencies:** (all levels):  
(e.g., government publications, public meetings/presentations, etc.)

☐ **Religious Groups:** (e.g., local church, youth groups, etc.)

☐ **Community Organizations:** (e.g., community/civic organizations, local university/college, local library, continuing education classes, etc.).

☐ **Computer Information:** (e.g., Internet or other computer-related information)

☐ **Your Local Outreach Office**

☐ **Public Meetings**

☐ **Other:** (specify)

100. In the past year, can you remember hearing or reading anything specifically that influenced your opinion about chemical weapons disposal issues?

☐ **Yes** (if “yes” ask where did you hear or read something specific about the site?  
(choose one – no prompt)



☐ **No** (if “no” skip to personal descriptors)



- ☐ **Newspapers**
- ☐ **Other Written Media**
- ☐ **Television: Radio**
- ☐ **Employer**
- ☐ **Contact with Professionals**
- ☐ **Personal Contact**
- ☐ **Government Agencies**
- ☐ **Religious Groups**
- ☐ **Community Organizations**
- ☐ **Computer Information**
- ☐ **Your Local Outreach Office**

101. Did this information make you more or less trusting about chemical weapons disposal related activities?

1. More Trusting
2. Less Trusting
3. No influence on Trust

Next I will read some statements about yourself.

Please tell me if the following statements describe you.

Personal Descriptors (Global)		Describes Me	Does Not Describe	Don't Know
102.	I am aware of the chemical weapons disposal process	①	②	⑥
103.	I understand the process (how) by which the Army disposes of chemical weapons	①	②	⑥
104.	I want to be informed about chemical weapons disposal at our local site.	①	②	⑥
105.	I am interested in participating in decisions made concerning the site.	①	②	⑥
106.	I would like to participate in decisions made concerning the site as long as I live in this area	①	②	⑥
107.	I know how to participate in decisions made concerning the site	①	②	⑥
108.	I have tried to participate in decisions made concerning the site but have quit because I felt my participation did not make a difference	①	②	⑥

## Demographic Information

Please tell us about yourself so that we can understand how different people feel about certain issues;  
(*READ CHOICES and PROBE + CLARIFICATION*)

1. What is your *age*? \_\_\_\_\_ (*ROUND UP TO NEAREST YEAR*)

2. Are you *Male* or *Female*? \_\_\_\_\_

3. What is your race?

a. Black /African American

b. White

c. Native American

d. Hispanic

e. Asian

f. Other: (*Please Specify*) \_\_\_\_\_

4. What is your *highest degree*?

a. GED

b. High School or Technical School

c. College

d. Graduate School

e. None

5. What is your current *employment situation*?

a. Work full-time

b. Work part-time

c. Laid-off or on strike

d. Unemployed (worker)

e. Unemployed (student)

f. Retired

g. Unable to work/disabled

h. Homemaker/Does not work outside home

i. Other: (*Please Specify*) \_\_\_\_\_

**THOSE ANSWERING d, e, f, or g SKIP to Q. 7**

6. Are you *currently* an employee at the site in \_\_\_\_\_?

a. yes

b. no

7. Were you previously employed at the site at \_\_\_\_\_?



8. Are any members of your family currently employed at the site in \_\_\_\_\_?
- a. yes
  - b. no
9. Were any member of your family previously employed at the site in \_\_\_\_\_?
- a. yes
  - b. no
10. How would you describe your main occupation?
- a. Managerial
  - b. Professional Specialty
  - c. Technical
  - d. Sales
  - e. Administrative Support
  - f. Service occupation
  - g. Protective Services
  - h. Farming/Fishing/Forestry
  - i. Manufacturing
  - j. Arts/Entertainment
  - k. Education
  - l. Laborer
  - m. Transportation
  - n. Military
  - o. Governmental
  - p. Other
11. How far do you live from the *nearest gate* at your local site? (**PROBE** (i.e., “*Just Approximately*”) + **CLARIFICATION**)
- a. less than 1 mile
  - b. 1 to 5 miles
  - c. 6 to 10 miles
  - d. 11 to 15 miles
  - f. 16 to 20 miles
  - g. 21 to 26 miles
  - h. 27 to 50 miles
  - i. Over 50 miles
  - j. Don't Know
12. What is your religious preference?
- a. Protestant (specify)
  - b. Catholic
  - c. Jewish
  - d. Muslim
  - e. Orthodox such as Greek or Russian
  - f. Latter Day Saints
  - g. None
  - h. Other

13. Which of the following best describes your family income:

- |    |                    |    |                   |
|----|--------------------|----|-------------------|
| a. | < 5000             | b. | 5,000 - <15,000   |
| c. | 15,000 - < 25,000  | d. | 25,000 - < 35,000 |
| e. | 35,000 - < 50,000  | f. | 50,000 - < 75,000 |
| g. | 75,000 - < 100,000 | h. | 100,000 and above |
| i. | D/K                | J. | Refused           |

14. How many people live in your household, including yourself? \_\_\_\_\_

15. Have you participated in a survey about the site in the past year?

- a. yes                      b. no

16. How many years have you lived in this town? \_\_\_\_\_ (round up to nearest year)